



Jane's  
POCKET GUIDE  
**MODERN MILITARY  
HELICOPTERS**

TIM RIPLEY

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*HarperCollins Publishers*

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# Introduction

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"Death from Above" was the famous insignia on the nose of Lieutenant Colonel Kilgore's UH-1 Huey gunship in Francis Ford Coppola's Vietnam War epic *Apocalypse Now*. The 25-minute long section of the movie where the 1/9th 'Air Cav' take a Vietcong-held village to the sound of Wagner's *Ride of the Valkyries* captured perfectly the essence of going to war by helicopter.

Since the Vietnam War the helicopter has been an integral part of every armed force, and rotary-winged aircraft have seen action in every major conflict and many small wars. This rapid acceptance of helicopters into the mainstream of military organisations in attack, reconnaissance, liaison, transport, medical and maritime roles has led one commentator to term them 'rotary-winged fighting vehicles'.

However, when helicopters first saw action during the Korean War, they were used by US armed forces for casualty evacuation and VIP transport only. Indeed, it was left to the French to first demonstrate the combat potential of the armed helicopter during their colonial conflict in Algeria. The 1950s and 60s also coincided with revolutionary developments in helicopter design, such as the tandem rotor and turboshaft powerplants.

The success of US Army and Marine Corps gunships in Vietnam spurred the Soviet, British, French, Italian, Israeli, German and numerous other armed forces to field their own fleets of helicopters for anti-tank and assault work. By the mid-1970s most armies had begun programmes to procure specialist attack helicopters, leading to the development of the

current generation of Cobras, Apaches, Tigers, A 129s, Mi-24s, Ka-50s and Rooivalks. It must be duly noted that these developments were often made in the face of stiff opposition from air force 'blue suiters', who saw the armed helicopter as a direct rival to their own fleets of fixed-wing close air support aircraft.

No such argument was put forward by the navies of the world, however, as they had been quick to embrace the armed helicopter for the anti-submarine and anti-surface vessel roles, as well as more conventional air transport duties.

Indeed, the 1982 Falklands War proved the worth of the helicopter in naval warfare, protecting the British fleet from Argentine submarine attack, decoying Exocet missiles with electronic jamming devices and sinking enemy shipping with guided missiles. Five years later US Army and Navy helicopters provided vital protection against Iranian fast patrol boats in Persian Gulf.

The 1991 Gulf War saw helicopters employed successfully in a wide range of roles by Coalition forces, whilst in the aftermath of the conflict, multi-national relief efforts to help Kurdish refugees in Northern Iraq depended on helicopters to fly in supplies to remote mountain camps.

In the post-Cold War world, humanitarian aid and peacekeeping missions have seen ostensibly military helicopters put to extensive use. Media images of United Nations relief operations in Somalia, Haiti, Rwanda, Bosnia and elsewhere are dominated by swarms of helicopters. NATO peace enforcing missions in Bosnia have seen the Apache



attack helicopter intimidating local forces into keeping the peace.

From a communist standpoint, Soviet forces used helicopter gunships to great effect during their long conflict in Afghanistan from 1979 onwards. The simple, but rugged, Mil Mi-8 and Mi-24 assault helicopters became familiar images on snatched footage shot by western television crews cowering with the Mujhadeen guerrillas at the bottom of parched Afghan valleys. In 1994 Russian helicopters were again in action against Islamic guerrillas in Chechnya. Combat helicopters from the former Soviet Union are much in demand because of their low cost and reliability. Proof of this has come very recently when, in a remarkable vote of faith in their former opponents' equipment, the South African-based mercenary organisation Executive Outcomes has become a regular user of Mi-8 and Mi-24s during its operations in Angola and Sierra Leone.

This Jane's guide aims to describe the major combat helicopters in service today, or in the final stages of development. We have classified combat helicopters as rotary-winged aircraft designed specifically for military use, or civilian machines adopted for use by military forces.

Increasingly, armed forces are making use of chartered civilian helicopters as a means to cut costs, and we have enclosed the types used by contractors in this study, particularly those chartered by the United Nations for humanitarian and peacekeeping missions.

We also take note of a number of major changes in the

helicopter industry. For example, the consolidation of helicopter manufacturers into a smaller number of larger companies is reflected in the usage of new company titles. We have, however, included details of what are termed 'heritage companies' for reference. As a rule, we have used the current name of the manufacturer, or last name manufacturer before production ceased.

The opening up of the Russian defence industry since the demise of the Soviet Union has meant that it is now possible to attribute long-established designs to their real manufacturers, rather than just link products to design bureau (known as OKB). Actual Russian helicopter and weapon designations are also used to supplement NATO reporting names.

Helicopter production continues around the world in large numbers in spite of the general down turn in global defence spending. This trend will continue as combat helicopters continue to be in the forefront of military thinking and actual operations well into the 21st Century. New technical developments such as the introduction of tilt rotors and advanced compound helicopters also offer military helicopter users significant improvements in both performance and operational capabilities.

Tim Ripley

Lancaster, October 1997

# Aerospatiale Alouette II (France)

Type: Light helicopter

Accommodation: One pilot; four passengers

## Development/History

After it first flew in 1955, the Alouette II became the world's first turboshaft powered helicopter to enter production.

### Variants

SE 3130: Two prototype Alouette IIs, powered by the 268 kW (360 shp) Turboméca Artouste I turboshaft.

SE 313B: Designation after Sud-Est merged with Geste Aviation in 1957, later re-named Sud-Aviation.

SE 3140: Alouette II development powered by a 298 kW (400 shp) Turboméca Turmo II engine, but none produced.

SA 3140: Alouette II derivative powered by the more economical Artouste IIa with a new centrifugal clutch.

SA 318C: Production version of SA 3140.

SA 3180 Lima: Powered by Turboméca Artouste IIIB. Assembled in India (Chetani) and Brazil (P&B 3150 Davisco).

### Status

French production ended 1976; Indian production continues.

### Operators

Argentina, Belgium, Benin, Bolivia, Cameroon, Chile, Congo, Ecuador, El Salvador, Dominican Republic, Germany, Guinea-Bissau, India, Lebanon, Namibia, Senegal, Sri Lanka, Togo, Tunisia.

### Manufacturers

Sud-Est/Sud-Aviation/Aerospatiale (France), Hindustan Aeronautics Ltd (India), Helikopters (Brazil), Swab (Sweden), Republic Aviation (USA).



*Aerospatiale Alouette II*

(Tim Rippl)

## Specifications (for SA 318C)

### Powerplant

One turboméca Artouste IIa turboshaft

Power: 530 shp (395 kW) de-rated to 360 shp (268 kW)

### Dimensions

Length: 39 ft 8 in (12.10 m)

Rotor diameter: 33 ft 5.6 in (10.20 m)

Height: 9 ft 12.75 m)

### Weights

Empty: 1961 lb (890 kg)

Max T/O: 3638 lb (1650 kg)

Payload: 1223 lb (560 kg)

### Performance

Max speed: 127 mph (205 km/h)

Range: 380 mi (720 km)

### Armament

AS11 and 12 wire-guided anti-tank missiles; free-flight rockets; machine guns

# Aérospatiale Alouette III (France)

Type: Light helicopter

Accommodation: Two pilots, five passengers

## Development/History

The best-selling Alouette III grew out of the smaller Alouette II. The first prototype flew in 1958 and rapidly became a best-selling machine with 2,262 built and 74 countries operating the helicopter at the height of its popularity. Originally intended for service with the French armed forces in Algeria, that conflict came to an end before it was in widespread use. Portuguese, Rhodesian and South African forces used the helicopter extensively in their long harsh wars with Nationalist guerrillas throughout Southern Africa. It has been used extensively in conflicts on the Indian sub-continent by Indian and Pakistan forces, performing well in the high Himalayas. Versions have been used for liaison, observation, attack, assault transport, anti-submarine warfare, anti-surface warfare, anti-aircraft, combat search and rescue, counter-insurgency and armed reconnaissance work.

Sud-Aviation, later Aérospatiale, were keen to use license production deals to foster business relationships in the Eastern Bloc and Third World. They were one of the first western aviation companies to offer technology transfer and work on the Alouette family helped establish the Indian, Romanian and South African helicopter industries.

## Variants

SE 3160: Alouette III powered by one 649 kW (870 shp) Turbomeca Artouste IIIB turboshaft, de-rated to 470 kW (550 shp).

SA 316A: Production version of SE 3160.

SA 316B: Featured strengthened main and tail rotor to allow



Aérospatiale Alouette III

(Tim Ripley)

## Specifications (for SA 319B)

### Powerplant

(One) Artouste XII/ (turboshaft)

Power: 670 shp (493 kW) (de-rated to 600 shp (442 kW))

Max T/O: 4,630 lb (2100 kg)

Payload: 1,650 lb (750 kg)

### Dimensions

Length: 33 ft 4 in (10.2 m)

Rotor diameter: 36 ft 1 in (11 m)

Height: 9 ft 9 in (2.9 m)

### Performance

Max speed: 136 mph (220 km/h)

Range: 375 mi (600 km)

### Weights

Empty: 2,436 lb (1105 kg)

### Armament

AS12 guided missiles; Mk44 ASW torpedoes; machine guns (pod or their mount); free-flight rocket pods



## Aerospatiale Alouette III (France)



**Aerospatiale Alouette III of Royal Netherlands Air Force**

(Tim Hüpley)

for greater performance. Produced in Romania as IAR-316B and in India as Chetak, SA 316C: Articulate HHO powered variant built in limited numbers.

SA 316B: Direct development of the SA 316B, powered by a more efficient and more

economical 649 kW (870 shp) Turbomeca Astazou XIV turboshaft, de-rated to 447 kW (600 shp).

G-Car: Rhodesian Air Force gunship versions with two side-mounted Browning machine guns. Gunship with single port firing 20 mm

Mossut cannon in cabin known as K-Car.

IAR-317 Skyfox: Prototype Romania gunship version, armed with anti-tank missiles, free-fall rockets and machine gun pods which did not enter production.

Atlas Aviation XM-1 Alpha: South Africa weapon system demonstrator for Rhinoceros attack helicopter.

### Status

Production in France ceased in 1983 after 1456 built. Some 230 built in Romania until 1989. Limited production continued only in India, with 300 built to date.

### Operators

Algeria, Angola, Argentina (navy), Austria, Belgium (navy), Burkina Faso, Burundi, Cameroon, Chad, Congo Republic, Ecuador (air force), Equatorial Guinea, France (army/navy/air force), Ghana, Greece (navy), Guinea, Guinea-Bissau, Iraq (army/navy), Iran, Ireland, Jordan, Lebanon, Libya, Malaysia (army), Mexico (navy), Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, Nicaragua, Pakistan (army/navy/air force), Peru (army/navy/air force), Portugal, Romania, Rwanda, South Africa, Suriname, Switzerland, Togo, Tunisia, UAE (Abu Dhabi), Venezuela (army), Congo (former Zaire) and Zimbabwe.

### Manufacturers

Sad-Aviation/Aerospatiale (France), ICA (Brisay) (Romania), Federal Aircraft Factory (Switzerland) and Hindustan Aeronautics Ltd (India).

# Aerospatiale Super Frelon (France)

Type: Heavy lift helicopter

Accommodation: Two pilots, up to 37 passengers

## Development/History

First flown in the 1962 to meet French Navy requirements for a maritime helicopter armed with anti-ship guided missiles and ASW weapons. Some remain in French service for logistical support and vertical replenishment at sea.

## Variants

- SA 321: Pre-production aircraft
- SA 321Q: French ASW version, later able to fire Exocet
- SA 321Qa: French navy cargo carrying and assault transport
- SA 321QM: Export version for Libya.
- SA 321F: Civilian version.
- SA 321H: Version sold to Iraq with Turmo III engines, Omron DRB-310 radar and Exocet missiles.
- SA 321 J1 Jn: Civilian version.
- SA 321K: Export transport version to Israel.
- SA 321L: Export transport version to South Africa.
- SA 321M: Export transport/rescue version to Libya.
- Changhe Z-9: Chinese-built naval and combat version.

## Status

Production continues in China only.

## Operators

France (navy), China (navy), Iraq and Libya.

## Manufacturer

Sud-Aviation/Aerospatiale (France) and Changhe Aircraft Factory (China).



*Aerospatiale SA 321 Super Frelon*

*(Tim Ripplay)*

## Specifications (for SA321G)

### Powerplant

Three Turbomeca Turmo MC turboshafts

Power: 4710 shp (3510 kW)

### Dimensions

Length: 63 ft 7 in (19.4 m)

Rotor diameter: 62 ft (18.9 m)

Height: 16 ft 2 in (4.9 m)

### Weights

Empty: 15 130 lb (6863 kg)

Max T/O: 28 000 lb (13 000 kg)

Payload: 11 023 lb (5000 kg)

### Performance

Max speed: 171 mph (275 km/h)

Range: 549 nm (1020 km)

### Armament

ASW torpedoes; depth charges; machine guns

# Eurocopter Gazelle (France)

**Type:** Light helicopter

**Accommodation:** One pilot, four passengers

## Development/History

Sud-Aviation began work on the Gazelle in the mid-1960s as a replacement for its Alouette family. By 1967 it had been put into the melting pot of the Anglo-French Helicopter Agreement, which was to see the joint development of the Gazelle, Lynx and Puma families of helicopters by Sud-Aviation (later Airbus Helicopters) and Westland's Westland. This agreement gave France the lead in Gazelle exports, and Airbus Helicopters was soon leading a major foreign sales drive. Exports and co-production deals resulted in more than 400 sales, 204 having ordered for construction in British form except 12 for the UK armed forces, which began flight just under 400. Total production was some 1,250.

A year later the Gazelle qualified as best light, and won the award with the regulatory 'freedom' of low-altitude take-off and landing. By the mid-1970s the aircraft was in widespread use with the British and French armed forces. From 1973 the French began to field the new SA 342 version, which sported an improved engine. Britain chose not to adopt the new engine for its Gazelles.

All six versions saw combat in the Falklands in 1982, but it was in the 1982 Lebanon war that a Syrian version armed with HOT anti-tank missiles showed the Gazelle's true potential as an armed helicopter. French HOT and Mistral anti-aircraft versions were used extensively during the 1991 Gulf War in the air cavalry role on the extreme left flank of the Coalition forces. Free Kuwaiti Gazelles fought alongside US Marine Corps forces to liberate Kuwait City. Yugoslavian-built versions have been used extensively in armed and unarmed roles during the civil war that broke out



**Westland Gazelle AH.66A** 1 of the British Army Air Corps

(Tim Ripley)

## Specifications (for SA 341)

### Powerplant

One Turbomeca Astazou 40A turbo-shaft  
Power: 653 hp (480 kW)

### Dimensions

Length: 29 ft 3 in (11.5 m)  
Rotor diameter: 34 ft 5 in (10.5 m)  
Height: 10 ft 2 in (3.2 m)

### Weights

Empty: 2022 lb (917 kg)  
Max T/O: 3570 lb (1600 kg)  
Payload: 1540 lb (700 kg)

### Performance

Max speed: 170 mph (310 km/h)  
Range: 261 nm (480 km), 19.1 nm (36 km)  
with max payload

### Armament

A512, A512, HOT, HOT and 4M14M Malyuk (AT-3 Sagger) wire-guided anti-tank missiles; 9M12M Strela (SA-7 Grail) and Mistral air-to-air missiles; Giat MG21 20 mm cannon; door- and pod-mounted machine guns, free-flight rockets

In 1991, with both original Gazelles seeing action against Slovenian, Croat and Bosnian forces.

400th and French Gazelles have been kept in the former Yugoslavia to support United Nations and NATO peacekeeping forces since 1992. British Army Gazelles operating in Northern Ireland have been fitted with a variety of specialist observation and close co-ordination systems.

### Variants

SA 340: Two prototypes, first with conventional rotors and landing gear, second fitted with rigid main rotor and helicopter landing gear.

SA 341: Four pre-production helicopters with enlarged cabin, semi-rotated rotors, 440 kW (590 shp) Astazou III and 3000 lb (1360 kg) maximum weight.

SA 341B: British Army Air Corps Gazelle AH 1, 212 built.

SA 341C: British Royal Navy Fleet Air Arm Gazelle HT 2, 40 built.

SA 341D: British Royal Air Force Gazelle HT 2, 29 built.

SA 341E: British Royal Air Force VIP transport Gazelle HCC 4, one built and three converted from HT 3s.

SA 341B: Civilian.

SA 341J: French Army Aviation version, 166 built.

SA 341F/Cannon: French Army Aviation M621 20 mm cannon armed version, 62 converted from original Es.

SA 341H: Initial French military export version.

SA 341M: Portuguese Yugoslav-built version.

SA 341M: French Army Aviation H62 armed version, 90 converted from original Es.

SA 342J: Civilian.



**Eurocopter SA 342 L1 Gazelle**

(Aerospatiale)

## Eurocopter Gazelle (France)



**SA 342K:** Upgraded military export version with 650 kW (880 shp) Astazou XVM powerplant and 4100 lb (1860 kg) maximum weight.

**SA 342L:** Military export model with improved fenestron. Some 170 built in Yugoslavia, including SA 342L GAZMA attack and SA 342L HCRA scout versions armed with Soviet line and armour and anti-air missiles.

**SA 342L1:** Military export version with Astazou XVM and 4400 lb (2000 kg) maximum weight.

**SA 342M Vignone:** Final production version for French Army Aviation, with Astazou XVM and HOT missiles. More than 200 produced. Some 30 fitted with Mistral missile to SA 342M/Celle standard and later SA 342M/STANT standard.

### Status

No longer in production

### Operators

Algeria, Bosnia-Serb Republic, Botswana, Cameroon, Canada, Cyprus, Ecuador, Egypt, France (Army), Guinea Republic, Iraq (Iraqi), Jordan, Kenya, Kuwait, Lebanon, Libya, Morocco, Oman, Senegal, Sierra Leone, Syria, Tunisia, UAE (Abu Dhabi), United Kingdom (Army/Army), Yugoslavia (Serbia/Montenegro).

### Manufacturer

Sud-Aviation/Helispatiale/Eurocopter (France), Westland Helicopters (UK), SOHO (Iraq), Arab-Industrial Helicopters Company (Egypt).

***Above:**  
Eurocopter SA 342M  
Gazelle for French  
Army Aviation  
(Tim Ripley)*

***Right:**  
Eurocopter SA 342  
Gazelle fires a HOT  
wire-guided anti-tank  
missile  
(Acrospatiale)*





# Eurocopter Dauphin/Panther (France)

Type: Light helicopter

Accommodation: Two pilots, 10 troops

## Development/History

Aerospace began development of the Dauphin (Dolphin) as a replacement to the Alouette II in the early 1970s, with the first flight taking place in 1972. The twin-engined version first flew three years later, and it has remained in production ever since, with worldwide sales and a number of licence production agreements being reached. A version with Allison engines entered service with the US Coast Guard in 1982 after a troubled programme to integrate the US-standard powerplant. Some have since been passed on to Israel. From 1986 onwards, military versions have been christened the Panther, with designations in the 565 series adopted accordingly. The Dauphin/Panther has grown to be a versatile and reliable light helicopter, which looks set to remain in production and service until well into the next century.

## Variants

AS 300: Initial prototype powered by single turbopropers Astazou XVI powerplant.  
AS 300B: Initial military version powered by single turbopropers Astazou XVIII powerplant.  
AS 360C Dauphin 2: Twin-engined version powered by 985 kW (1341 shp) turbopropers Arriel turboshaft. In 1990 re-designated as AS 365D2 Dauphin 2. C1, C2, C3 versions.  
AS 365N: Improved version with retractable undercarriage.  
AS 365N1: Further improvement with 11-bladed Arriel main and up-rated Arriel TC1 powerplant.  
AS 365N2: Civil version with turbopropers 1 R7 powerplants.  
AS 365B/M: First military version of twin-engined



*Eurocopter SA 360NH-66 Dauphin*

*(HDF Sparhawk unit)*

## Specifications (for AS 565 Panther)

### Powerplant

Two turbopropers Arriel IV4 turboshafts

Power: 1566 shp (1168 kW)

Payload: 3527 lb (1600 kg)

### Performance

Max speed: 164 mph (264 km/h)

Range: 477 nm (875 km)

### Dimensions

Length: 29 ft 1 in (11.6 m)

Rotor diameter: 29 ft 4 in (12.1 m)

Height: 13 ft 1 in (3.9 m)

### Armament

400 M621 20 mm cannon pods; Mistral air-to-air missile; IDF wire-guided anti-tank missiles; free-flight rockets; AS301 and Entec anti-ship missiles; Murene torpedoes

### Weights

Empty: 4025 lb (2193 kg)

Max T/O: 9369 lb (4250 kg)

AS365M2, the attack and troop transport. The was renamed the Panther, powered by Turbomeca TM1 and marketed under the following versions: AS 565AA two flight rocket and gun armed; AS 565QA utility; AS 565CA troop tank; AS 565T maximal version with retractable undercarriage; AS 365F-1 navalised version; AS 565SA anti-shipping; AS 565MA medical rescue; AS 565SL search/attack rescue.

AS 365M3: Upgraded version with two Turbomeca Arriel 2C turboshafts. Panther variants were designated SA 365 HX utility; SA 365 AH combat/attack armed; SA 365 MB shipborne utility; SA 365 SB amphibious armed.

AS 365M4: Civil water-busy version, seating 14 and powered by Arriel 2L.

AS 565B (Indienis): Brazilian version of K model designated H64-1 by Brazilian army.

Panther 1000: Piquisat US Army version of 1st and later production.

AS 300C1: Version produced for US Coast Guard under designation HH-65A, with Reaction Engines LP51-1.750A-1 engines, specialised night vision and rescue equipment. Also used by Israel.

Dauphin Z-6 (Huntar): Chinese version assembled from French kits.

Dauphin Z-11A-100: Chinese-made version with WZ-6A powerplant, rated to 546 kW (734 shp), which can be armed.

### Status

In production in France, Brazil and China.



**Eurocopter AS 565 Panther**

(Aérospatiale)

## Eurocopter Dauphin/Panther (France)



### Operators

Angola, Bangladesh, Brazil (military), Burkina Faso, Cameroon, China, Congo, Côte d'Ivoire, Dominican Rep., Fiji, France (navy, air force), India (air force), Ireland, Israel, Romania, Saudi Arabia (military), Sri Lanka, Taiwan, Thailand (military), UAE (Abu Dhabi), USA (Coast Guard).

### Manufacturers

Aérospatiale/Eurocopter (France), Helibras (Brazil) and Harbin Aircraft Manufacturing (China)

**Eurocopter AS 565F  
Panther**  
(Tim Ripley)

# Eurocopter Ecureuil/Fennec (France)

Type: Light helicopter

Accommodation: Two pilots, two/three passengers

## Development/History

The three-blade bladed squirrel (Squirrel) first flew in 1974 and has remained in production ever since, attracting several thousand military and civilian customers around the globe. The single-engine HT100 version was soon supplemented by the twin-engine 355 series aircraft, which provided greater performance. Since 1990 specialist military versions of the Ecureuil have been marketed under the Fennec (fox) name, using the series 355 series designation.

## Versions

**AS 350 Ecureuil:** First prototype with single turbine, developing 115 hp (84 turbohp).

**AS 350B4/B2/B3:** Civilian/military version with single turboprop. AS 350B4: B2 with Arriel 1D1, B3 with Arriel 2.

**AS 350D:** Civilian version with single turbine, developing 115 hp (84 turbohp). Known as AS350 in USA.

**AS 350 Firefighter:** Specialised version.

**AS 350B2:** First armed version, powered by 560 kW (752 shp) turbomécanique Arriel 1D1, known as Fennec. AS 550C2/A3 anti-tank version. Other Fennec versions include: AS 550U2/U3 unarmed utility; AS 550A2/A3 armed, cannon or rockets; AS 550V2 medical evacuation; AS 550S2 armed naval anti-shipping; AS 550U3/A3/C2 are Arriel 2B powered.

**HB 350B/H1 Esquillo:** Modified Brazilian version, designated CH-50 and TH-50 by Brazilian Air Force, H11-12 by Brazilian Navy.

**HB 350L1 Esquilo:** Armed Brazilian version, designated H1A-1 by Brazilian army.

**Squirrel HT 1/HT 2:** UK training version of AS 350B3.



*Eurocopter AS 355 Ecureuil*

*(Tim Ripley)*

## Specifications (for AS 350B)

### Powerplant

One Turbomécanique Arriel 1B turboprop

Power: 641 shp (470 kW)

Max TQ: 4030 ft-lb (5400 kg)

### Dimensions

Length: 35 ft 10 in (10.9 m)

Rotor diameter: 35 ft 10 in (10.9 m)

Height: 10 ft 11 in (3.3 m)

### Performance

Max speed: 175 mph (287 km/h)

Range: 394 mi (630 km)

### Armament

Heat M621 20 mm cannon pod; 7.62 mm machine gun pod, three-point rockets; 100W wire-guided anti-tank missiles; Mistral air-to-air missiles; anti-submarine torpedoes.





**AS 360BA in service with the Australian Army (APU)**

- 1554 Ecureuil: first production version with two 117 kW (160 shp) Allison 250-C20B turboshafts
- AS 355A: later model 2: improved version with two 140 kW (186 shp) Turbomeca Arriel 1A. Civil version known as AS 355F (Euro Star in USA)
- AS 355F: improved rotor blade version

AS 355F1: French export version. 12 has upgraded transmission

AS 355M2: French export version

■ 555 Fennec: twin-engine version. AS 555AN armed version with 20 mm cannon, AS 555BN troop and utility version; AS 555AR armed naval version; AS 555AR edition/market armed version; AS 555BR utility version; AS 555BR naval utility version; AS 555BN improved naval version, AS 555BN armed naval version

Z-11: Chinese produced copy with WZ-6B Powerplant, rated to 140 kW (189 shp)

AS/HB 555P2: Brazilian version, designated CH-35 and M-35, or Euphrates by Brazilian air force, HB-12B by Brazilian navy

(two signed): UK Air Transport version of AS 350B1

### Status

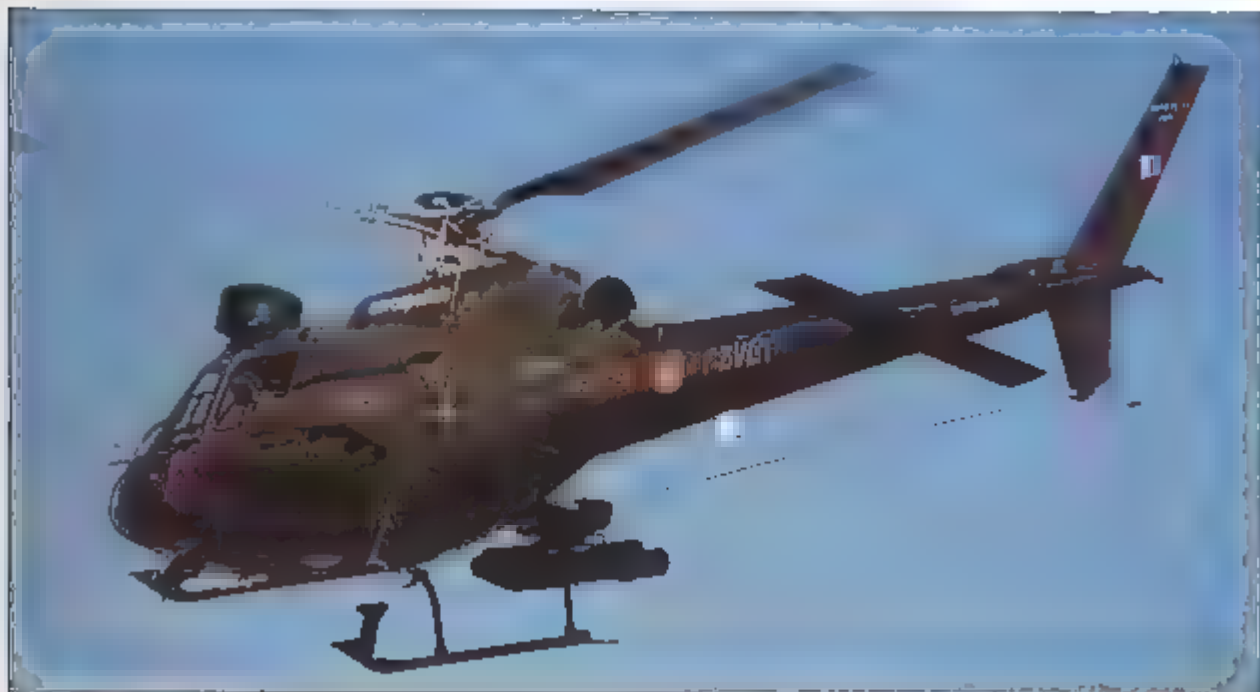
In production in France, China and Brazil.

### Operators

Argentina (army guard), Australia (army, navy, air force), Benin, Botswana, Brazil (army, navy, air force), Central Africa Republic, Denmark (army), Djibouti, Ecuador (army), Egypt, France (army, navy, air force), Iceland, Ireland, Malawi, Paraguay (army air force), Sierra Leone, Singapore, Tunisia, UAE (Abu Dhabi), UK (air force, army).

### Manufacturers

Armaspaul (Argentina), Changhe (China) and Helicops (Brazil).



**Eurocopter AS 550 C5 Fennec**

(Eurocopter)

# Eurocopter Puma (France)

Type: Medium lift helicopter

Accommodation: Two pilots, loadmaster, 20 troops

## Development/History

Work on the SA 330 began in 1963 but the programme became multi-national as a result of the 1967 Anglo-French helicopter agreement. This resulted in Westland building 48 for the British Royal Air Force. Under this arrangement future development and export work on the design was the responsibility of Aerospatiale, later Eurocopter, who began a vigorous sales drive in the 1970s. British and French Pumas have seen action in the 1991 Gulf War and supporting peacekeeping missions in the former Yugoslavia. South Africa has used the Puma extensively as the main transport in Angola and South West Africa. French production ended in 1992 after 107 built. The design was superseded by Super Puma (Cougar) version later the late 1990s. The main centres of Puma development were in South Africa (see Dryc entry) and Romania, where extensively upgraded versions are produced.

## Variants

SA 330: First eight French prototypes

SA 330B: French Army Avulthion version.

SA 330C: Military export version.

SA 330F: Royal Air Force version, designated Puma III.

SA 330F HC: Civilian versions with 1174 kW (1575 shp)

Turbo EC powerplant.

SA 330H: Military version with 1174 kW (1575 shp) Turbo EC powerplant. Designated SA 330B by French air force, even though different from the French army's SA 330B.

SA 330F H1: Improved G101 variants with glass fibre rotor blades.



Westland Puma HC.Mk 1

(Tim Rippl)

## Specifications (for SA 330)

### Powerplant

EC-1190 Turboprop • Turbomec EC-1190 Turboprop

Power: 3150 shp (2350 kW)

Payload: 2055 lb (920 kg)

### Performance

Max speed: 160 mph (271 km/h)

Range: 300 nm (572 km)

### Dimensions

Length: 40 ft 9 in (12.4 m)

Rotor diameter: 49 ft 2 in (15 m)

Height: 16 ft 10 in (5.1 m)

### Armament

Machine guns; Romanian versions spotted four-right rocket pods; 9M14M Malynika (AT-3 'Sagger') wire-guided anti-tank missiles, hull-mounted 20 mm cannons, 220 lb (100 kg) free-fall bombs; A-92 air-to-air missiles

### Weights

Empty: 8303 lb (3766 kg)

Max T/O: 14 315 lb (7400 kg)

SA 330S: Portuguese version with OH1A1 engine for maritime surveillance and Makila powerplant.  
IAH-330L: Hong Kong-built version, systems upgrade underway including installation of SOCAT (Optronic Search and Control) Anti-Air/Land weapon package.  
Puma 330M: Proposed Romanian version with glass cockpit.  
ASA 330: Indonesian-built version.  
AS 330B (Orchidee): Experimental French test bed for Orbitec ground surveillance radar.

## Status

Production continues only in Romania

## Operators

Argentina (armed guardship), Algeria, Cameroon, Côte d'Ivoire, Congo (armed), Côte d'Ivoire, Ecuador, Ethiopia, France (army/air force), Gabon, Guinea Republic, Honduras (air force), Iran, Kenya, Kuwait, Lebanon, Malaysia, Morocco, Nepal, Nigeria, Pakistan (army/air force), Philippines, Portugal, Romania, Senegal, South Africa, Spain, Sudan, Togo, UAE (Abu Dhabi), United Kingdom (air force).

## Manufacturer

Sud-Aviation/Aérospatiale/Eurocopter (France), Westland Helicopters (UK), IPTN (Indonesia), IAR SA Ibrava (Romania)



# Eurocopter Super Puma/Cougar (France)

Type: Medium lift helicopter

Accommodation: Two pilots, loadmaster, 25 passengers

## Development/History

A 'growth' development of the basic Puma, the Super Puma first flew in 1978 boasting more powerful Mikulic powerplants. Although aimed mainly at the civilian market, AirbusHelicopters (now Eurocopter) have marketed specific military versions under the brand name Cougar, giving the latter G2 designation. Stretched versions with greater seating capacity have been fielded, and a wide range of armament options are available. Recent developments have included a number of night vision options and an flight reconfiguring for combat, search and rescue. The French Army are also planning to use the Puma as the platform for their (HUU/6R) ground surveillance radar system.

## Variants

AS 332B: First military version with Mikulic powerplants.

AS 332C: First civil version.

AS 332F1: Naval version.

AS 332L1: 'Stretched' civilian version.

AS 332L2 Super Puma Mk 2: Civil transport.

AS 332L2 Super Puma Mk 2 VIP: Civil VIP transport.

AS 335M: Stretched military version, pre-production tested.

AS 332M1: 'Stretched' military version.

AS 532 Cougar Mk 1: In 1990 B, L and M versions re-designated and the name Cougar adopted for military sales.

AS 532AC, UB and UC for short fuselage and military.

Armed/unarmed: AS 532AL and UL for long fuselage.

Military armed/unarmed: AS 532SC naval, armed anti-

submarine/anti-ship.



*Eurocopter AS 332 M1 Super Puma*

*(Eurocopter)*

## Specifications (for AS 532UL Cougar Mk 1)

### Powerplant

Two Turbo-mech Mikulic 1A1 free turbines

Power: 1754 shp (1280 kW)

Max 1PD: 15 041 lb (6800 kg)

Payload: 9920 lb (4500 kg)

### Dimensions

Length: 50 ft 11 in (15.5 m)

Rotor diameter: 51 ft 2 in (15.6 m)

Height: 15 ft 9 in (4.8 m)

### Performance

Max speed: 142 mph (229 km/h)

Range: 334 nm (610 km)

### Armament

20 mm or 7.62 mm guns; free-flight rockets;

naval versions can carry the AM 39 Exocet anti-

ship missile or bombing torpedoes

### Weights

Empty: 9540 lb (4320 kg)





*Eurocopter AS532 UL Cougar Mk 1 with Horizon battlefield surveillance system*

*(Eurocopter)*

## Eurocopter Super Puma/Cougar (France)

AS 532 Cougar Mk 2: Stretched version with 1600 kW (2104 shp) Makila 1A2 powerplant, civilian counterpart designated Super Puma II. In-flight refuelling optional. AS 532A2 armed combat rescue version. AS 532U2 armed utility with stretched fuselage. AS 532M naval, vertical anti-submarine.  
Cougar 100: Reduced capability export version.  
AS 532U1, HORIZON: Ground surveillance version developed from Orbiclee system.  
NAS 332B: Indonesian utility designation.  
NAS 3321: Indonesian naval designation.  
CH-34: Brazilian designation for 332M.  
H117: Spanish Army designation for 332B.  
HD.21: Spanish Air Force search and rescue designation.  
H121A: Spanish VII designation.  
Hkp.10: Swedish search and rescue designation.

### Status

In production in France and Indonesia.

### Operators

Anguilla (coast guard, army), Brazil (navy/air force), Cameroon, Chile (army/navy/air force), China, Congo (Zaire), Côte d'Ivoire, Ecuador, France (air force/army), Qatar, Indonesia (navy/air force), Iraq, Japan, Jordan, Kuwait, Malaysia, Mexico (air force), Nepal, Netherlands, Nigeria, Panama, Peru (army), Qatar, Saudi Arabia (navy/air force), Singapore, South Korea (air force), Spain (army), Sweden (air force), Switzerland, Thailand (air force), Turkey (army), UAE (Abu Dhabi), Venezuela.



### Manufacturer

Aérospatiale/Eurocopter (France, IPN (Germany) and Singapore markets were assembled in country from kits. TAI (Turkey) has signed a deal for co-production.

**Eurocopter AS 532SC  
Cougar  
(Tim Alpay)**



*Eurocopter AS 332A2 Cougar rescue version with in-flight refuelling probe*

*(Tim Ripley)*

# Eurocopter BO 105 (Germany)

Type: Light helicopter

Accommodation: Two pilots, three passengers

## Development/History

This German light helicopter made its first flight in 1967, and by the mid 1970s was in widespread service with the German Army – some 96 light observation and 268 BO105C15s armed with tank versions were eventually delivered. Delays in the Franco-German (sic) programme meant it took time to soldier on to these roles until well into the next decade. It has been widely exported to civilian and military customers around the world.

## Variants

BO 105C: Initial version.

BO 105C14: Basic light observation/utility version.

BO 105C15: Strengthened utility version, with capacity for four passengers.

BO 105C15S: Strengthened utility version, with capacity for six passengers. Designated Hkp 96 by Swedish Army.

BO 105LS: Canadian produced version with uprated Allison 250 C20L powerplant.

BO 105M (VBM): German scout version.

BO 105H1AH-1: Basic German anti-armour version fitted with six HOT missile tubes.

BO 105H1AH-1A1: Improved German anti-armour version with new rotors.

BO 105H1AH-1 Phase 2: Proposed German night attack version.

BO 105H1B1: Proposed German scout version with four Stinger air-to-air missiles.

BO 105H1phd1: Light attack all-weather (AW) version.

BO 105ATH/HA.15: Spanish anti-armour version.



*Eurocopter BO 105 CBS*

*(Eurocopter)*

## Specifications (for BO 105C)

### Powerplant

Two Allison 250-C20B turboshafts

Power: 240 hp (176 kW)

Max T/O: 5,511 lb (2,500 kg)

Payload: 470

### Dimensions

Length: 28 ft 11 in (8.8 m)

Rotor diameter: 32 ft 2 in (9.8 m)

Height: 9 ft 11 in (3 m)

### Performance

Max speed: 140 mph (240 km/h)

Range: 550 nm (1,020 km)

### Armament

HOT and IRW anti-guided anti-tank missiles;

20 mm Rheinmetall cannon

### Weights

Empty: 2,665 lb (1,208 kg)

**BO 105G51/HR/A.15:** Spanish armed scout version with 28 mm cannon.  
**BO 105C01/HB.15:** Spanish observation version.  
**NBO 105:** Bear helicopter-built version.  
**NBO 105S:** Stretched Indonesian version.  
**BO 105CH-5/MSS:** Search and rescue/maritime version with surveillance radar.  
**BO 105 15 A-2:** Powered by two Allison 250-C 28C engines. Super Lite, optimised for under-slung loads.  
**EC-Super Lite:** High performance version of CH-5 for civil market.

### Status

in production

### Operators

Bahrain (armed), Chile (military force), Cuba, Colombia (navy), Germany (army), Indonesia (army/navy/air force), Iraq, Jordan, Kenya, Kuwait, Mexico (navy), Netherlands (army), Nigeria, Peru (army), Philippines (navy), Spain (army), Sweden (army), Thailand, UAE (Dubai)

### Manufacturer

Messerschmitt-Bölkow-Blomh/Eurocopter (Germany), HPH (Indonesia), LVA (Spain), Eurocopter Canada (Canada)





# HAL Advanced Light Helicopter (ALH) (India)

Type: Light multi-role helicopter

Accommodation: Two pilots, 12-14 passengers

## Development/History

India's indigenous light helicopter programme was slowed by financial problems throughout the 1980s, delaying the first flight until August 1992. Three prototypes are now flying, but question marks still remain over when it will enter service with the Indian armed forces. The first order for eight was placed in 1997, and the second order is expected in 1998. A production rate of 26 per year is expected from 2002 onwards.

## Variants

Army/Air Force: skid landing gear

Naval version and folding tail

Light Attack Helicopter: Proposed spinning version,

## Status

In pre production.

## Operators

Nil.

## Manufacturer

Helicopter Aeronautics Limited (HAL) (India)



HAL Advanced Light Helicopter

(Jane's Information Group)

## Specifications

### Powerplant

Two turbomérs TA1333-2B

Power: 2000 shp (1452 kW)

### Dimensions

Length: 42.0 ft (12.80 m)

Rotor diameter: 43.3 ft (13.2 m)

Height: 10.13 m (4.98 m)

### Weights

Empty: 5511 lb (2500 kg)

Max T/O: 11 073 lb (5000 kg)

Payload: underslung only

### Performance

Cruising speed: 152 mph (245 km/h)

Range: 400 nmi (800 km)

### Armament

20 mm cannon turret; free-flight rockets; four air-to-surface guided missiles; two air-to-air missiles; mine dispensers; dipping sonar; two hoisting ladders

# Eurocopter Tiger (International)

Type: Attack helicopter

Accommodation: Pilot (front), weapons operator (rear) in tandem

## Development/History

Intended to replace the Gazelle in French service and the BO 105 in German service, the Tiger has its origins in a memorandum of understanding signed by the two countries in 1984. After a protracted process, a development contract was signed in November 1989 and work began in earnest to produce five prototypes.

In the early years of the programme both France and Germany were keen supporters of the Tiger but defence cutbacks in the 1990s have forced the delivery programme to be stretched out, with the first batch of 100 airframes for each country not entering service until the next century (Germany in 2005 and France in 2007). Initially Germany will receive only OHU close support version, while the French are to receive 20 escort/force support and 10 anti-tank models. Production of the remaining aircraft will then last until 2025, with a total of 216 being built for France and 212 for Germany.

Anti-tank versions are armed with 160 mm Tiger anti-tank missiles; a mast-mounted forward looking infra-red sight and air-to-air missiles are also optional. The scout/force support versions are armed with a turret-mounted 30 mm HAA cannon under the nose, air-to-air missiles and rocket pods.

## Variants

OHU: Variant; initial German escort version

HAP: French escort version

HAC-3300: French anti-tank version

PAH-2 Tiger: Initial German anti-tank version



*Eurocopter Tiger*

*(Eurocopter)*

## Specifications

### Powerplant

Two Allison-Turbomeca ART 930 turbofans

Power: 2300 shp (1916 kW)

### Dimensions

Length: 35 ft 11 in (11 m)

Rotor diameter: 42 ft 7 in (13 m)

Height: 14 ft 7 in (4.5 m)

### Weights

Empty: 7275 lb (3300 kg)

Max LTO: 12 787 lb (5800 kg)

### Performance

Max speed: 174 mph (280 km/h)

Climb rate: 3100 ft/min

### Armament

(HAP) G1A AM-302B 30-mm cannon; Mistral air-to-air missiles; GB anti-rockets; (PAH-2/HAC) HOT 2/3 wire-guided anti-tank missiles; long-range Hegal anti-air guided anti-tank missiles; AGM-114 laser-guided anti-tank missiles; Stinger or Mistral air-to-air missiles; machine gun pods

## **Eurocopter Tiger** (International)

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UH1: German multi-role close support version, originally designated UH1L.  
HCP: Export multi-role version, without roof-mounted sight.  
W-Tiger: Export anti-tank version.

### **Status**

In pre-production.

### **Operators**

Nil.

### **Manufacturer**

Eurocopter (France/Germany)

**Eurocopter Tiger**  
(Eurocopter)



# EH Industries EH.101 Merlin (International)

**Type:** Shipborne ASW helicopter/utility helicopter

**Accommodation:** Two pilots, observer, sonar operator

## Development/History

This joint British-Italian collaborative programme began in 1979 to develop a Sea King replacement for both countries' navies. Funding was agreed in 1984 to proceed with building the prototypes and subsequent development. The first prototype flew in the UK in 1987, and since then, the programme has led to the development of all dedicated maritime, utility, shipborne early war and civil passenger versions. Current order books stand at 48 maritime versions for the British Royal Navy and 22 utility for the Royal Air Force in Wessex and Puma replacement. Italy's Navy has ordered eight maritime, four shipborne early warning and four utility versions.

Major orders were expected from Canada but the programme was cancelled in 1994 after a change of government. Export orders now being keenly sought from Canada (Jepard), Portugal, Japan and the Maldives. As the Merlin programme for the Royal Navy is unique because Westland – the helicopter manufacturer – is not the prime contractor, Lockheed Martin is prime contractor, being responsible for integrating the complex anti-submarine sensor and weapon systems with the airframe.

## Variants

Merlin HAS 3: Royal Navy shipborne helicopter

EH.101 ASW/ASWW: Italian maritime helicopter

EH.101 AW: shipborne shipborne early warning version

EH.101 Utility: Italian naval transport version.

Merlin HC 3: RAF support helicopter.

Heliliner: Civilian version



*EH Industries EH.101 Merlin*

*(GKN Westland)*

## Specifications (Basic Naval version)

### Powerplant

Three Rolls-Royce RB173s, a W53 322

turboshafts (600), General Electric 3700-GE-1GA

(120 hp)

Power: 6936 shp (5177 kW) - 5142 shp (3834 kW)

### Dimensions

Length: 73 ft 10 in (22.6 m)

Rotor diameter: 61 ft (18.6 m)

Height: 25 ft 10 in (7.6 m)

### Weights

Empty: 15,700 lb (7121 kg)

Max T/O: 28,000 lb (12,690 kg)

Maxload: 10,000 lb (4536 kg)

### Performance

Max speed: 192 mph (303 km/h)

Range: 675 mi (1150 km)

### Armament

VL 46, Sting Ray torpedoes; Sea Skua radar-guided anti-ship missiles; depth charges



**CH-140 Petrel:** Proposed Canadian mid-size version,  
**CH-140 Cormorant:** Proposed Canadian rescue version,  
**Cometant:** Proposed Canadian rescue version.

### **Status**

In production.

### **Operators**

Italy (navy), UK (navy/air force).

### **Manufacturer**

Agusta (Italy) and Westland Helicopters/GKN Westland (UK).

### **Left**

**EH Industries EH.101 Merlin**  
(GKN Westland)

### **Right**

**EH Industries EH.101 Merlin**  
(GKN Westland)





# NATO Helicopter Industries NH 90 (International)

Type: Multi-role medium-lift/maritime helicopter

Accommodation: Two pilots, (NFH) three systems operators, (THH) 20 troops

## Development/History

This multi-national project began in 1993 and originally involved five nations. However, Britain pulled out in 1997, leaving France, Germany, Italy and the Netherlands to continue building the NATO Frigate Helicopters (NFH) and Tactical Transport Helicopter (THH). Full scale development began in 1992, and the first prototype flew in 1995. The second prototype equipped with fly-by-wire flight control systems flew in 1997.

Defence cutbacks in Western Europe have led to the programme being scaled down and delivery dates slipped. In mid-1997 the funding for the production/delivery schedule was agreed. The Netherlands is taking 20 NFHs from 2003, Germany wants 20 tactical transports from 2003 and 38 NFH from 2007, France has ordered 27 NFHs from 2005 and 13 THHs from 2004, and Italy requires 11 NFHs and 14 THHs from 2004. In total, 647 helicopters are on order, but few commentators expect the programme to survive future European defence budget cuts.

## Variants

NH 90: NATO Frigate Helicopter for shipborne anti-submarine and utility tasks  
THH: tactical transport helicopter

## Status

In production.

## Operators

None



NH Industries NH 90

## Specifications (For NFH)

### Powerplant

Two Rolls-Royce Indenorca/Maggie RTM 322-018 or General Electric/TALe Romeo 700 G1-401X turboshafts  
Power: Respectively 4250 shp (3190 kW) or 4800 shp (3576 kW)

### Dimensions

Length: 52 ft 10 in (16.11 m)  
Rotor diameter: 53 ft 5 in (16.3 m)  
Height: 13 ft 10 in (4.22 m)

### Weights

Empty: 11,741 lb (5326 kg)  
Max T/O: 20,000 lb (9070 kg)  
Payload: 4400 lb (1996 kg)

### Performance

Max speed: 180 mph (180 km/h)  
Cruising range: 650 nm (1204 km)

### Armament

Anti-submarine: torpedoes, anti-ship missiles, depth charges; 7.62 mm or 12.7 mm dual guns

**Manufacturer**

NH, with Eurocopter  
(France/Germany), Agusta (Italy)  
and Fokker (Netherlands).



**Right:**  
**NH Industries NH90**  
*(Library Flickr/API)*

# Agusta A 109 (Italy)

Type: light helicopter (for A 109CM)

Accommodation: two pilots, six passengers

## Development/History

Agusta's stylish light helicopter first flew in 1970 and has sold well around the world since 1975. Armed military versions first entered service with the Italian Army in 1980, although Belgium is the only export customer for this model. To date, more than 670 have been produced in all military and civil versions.

## Variants

A 109: Initial production version

A 109A Mk II: Civil version

A 109C: 'Wide body' version with improved transmission

A 109EQA: Basic Italian army version

A 109CM: Limited production military versions with sensor weapon improvements

A 109MA: Italian Army version with Hellfire air-guided anti-tank missiles

A 109K: Improved transmission and longer life for power division

A 109K2: Swiss export version

A 109MM: Fixed undercarriage, with 550 kW (738 hp)

Turbomeca Arriel 1C3 Powerplant for 'hot and high' operations

A 109KN: Naval version

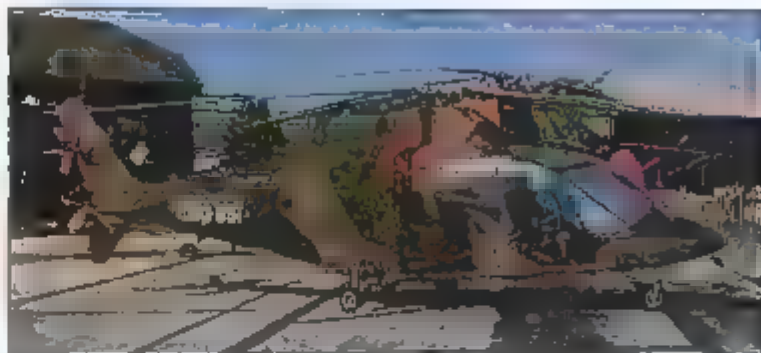
A 109MAK: Medical evacuation version

A 109QMF: Coast guard version

A 109 Power: Two Pratt & Whitney 206C powerplant, certified to 732 shp (545 kW)

## Status

In production.



Italian army Agusta A109

Jeremy Flack/AP/H

## Specifications

### Powerplant

Two Allison 250-C20B1 turboshafts

Power: 550 shp (402 kW)

### Dimensions

Length: 35 ft 1 in (10.7 m)

Rotor diameter: 36 ft 1 in (11 m)

Height: 11 ft 5 in (3.5 m)

### Weights

Empty: 3500 lb (1590 kg)

Max T/O: 5997 lb (2720 kg)

Payload: Underwing 2000 lb (907 kg)

### Performance

Max speed: 193 mph (311 km/h)

Range: 420 nm (770 km)

### Armament

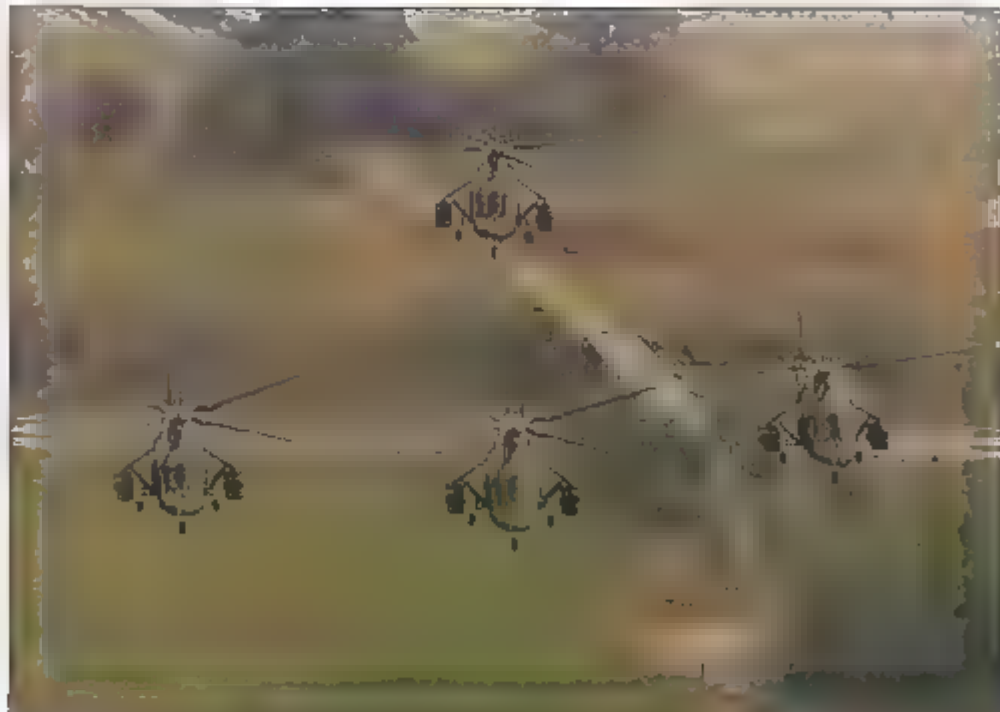
TOW-2A wire-guided anti-tank missiles; machine gun pods; free-flight rocket pods; Stinger air-to-air missiles.

**Operators**

Argentina (navy/army), Belgium,  
Italy (army), Malaysia, Peru  
(army), Slovenia, UK (army),  
Venezuela (army).

**Manufacturer**

Agusta (Italy).



*Right*  
**Agusta A109 Mangusta**  
(Tim Ripley)

# Agusta A 129 Mangusta (Italy)

Type: Light attack helicopter

Accommodation: Two pilots in tandem

## Development/History

Italy's *Elicotte Mangusta* (Mongoose) is the first custom-designed Western European attack helicopter to enter frontline service with a NATO country. With a track record in helicopter construction dating back to 1952, Agusta began working on the Mangusta in the mid-1970s in response to an Italian Army requirement for a specialist anti-aircraft helicopter.

US experiments with the Cobra and early versions of the Apache obviously influenced the design of the Mangusta, which made its first flight in 1983. Five prototypes were flying by 1984, with a delivery date scheduled for the end of 1987. However, the 1988 production aircraft were not delivered until 1990, with 15 being subsequently purchased per month. The delay in deliveries was due to funding problems with the Hughes/Emerson/Saab Helo-1000 three-mounted anti-tank missile sight system.

The initial Italian Army order for 60 aircraft has since been followed by plans to develop a multi-role scout/gunship version. This variant boasts a chin-mounted Inertial aimed sight with 12.7 mm (0.50 inch) and 7.62 mm (0.31 inch) machine guns. If a new-build version is not ordered, then 20 of the original aircraft may be converted. Despite the A129 seeing combat service with the Italian United Nations contingent in Somalia during 1993, export orders have not been forthcoming – it has lost out to British, Dutch, Malaysian and several other Eastern attack helicopter competitors.



Agusta A129 Mangusta

(Dier Hopley)

## Specifications

### Powerplant

Two Rolls-Royce Turbomeca  
Power 1670 shp (1230 kW)

### Dimensions

Length: 40 ft 3 in (12.3 m)  
Rotor diameter: 39 ft (11.9 m)  
Height: 11 ft 11 in

### Weights

Empty: 5575 lb (2529 kg)  
Max T/O: 9635 lb (4370 kg)  
External workload: 2645 lb (1200 kg)

### Performance

Max speed: 163 mph (264 kmh)  
Endurance: 3 hours 5 minutes

### Armament

Four hard points, 100, 100, 2 or 2A wire-guided anti-tank missiles; Hellfire laser-guided anti-tank missile; AIM-9L Sidewinder, Stinger, Javelin, Mistral air-to-air missiles; machine gun pods; free-flight rocket pods; 20 mm balling gun chin turret, or 12.7 mm (0.5 in) chin gun tested but not in service.

## **Variants**

**A 129:** Basic Italian Army anti-tank version.

**A 129 Scout:** Proposed reconnaissance version with mast-mounted sight and chin gun turret.

**A 129 International:** Export version with two UTEC faced engines, five main rotor blades and improved weapons systems.

**A 129 Stalpunkt:** Proposed navalised version.

**A 129 Multi-Role:** Proposed future-up to current in-service version, similar in capability to international version, and armed with turret-mounted 20 mm Gatling gun.

## **Status**

In production.

## **Operators**

Italy (only)

## **Manufacturer**

Agusta (Italy).

## **Right**

**Agusta A129 Mangusta**

*(Tim Ripley)*





# Agusta-Bell AB 212 (Italy)

**Type:** shipborne anti-submarine helicopter

**Accommodation:** two pilots, sonar operator, radar operator, or seven passengers

## Development/History

This specialist anti-submarine version of the popular 412 airframe has become the standard shipborne helicopter for many NATO navies. They are easily identified by the large radar masts in the cockpit and under the forward hull. A variety of surface surveillance radars have been installed, including MEI ARI-5955, MM/ARCS-2055 or Ferrando Seaquest. Bendix AR/ARCS-1551 anti-aircraft radars have been fitted for anti-submarine work. A weapons carriage is a standard with either a mix of anti-submarine torpedoes or anti-ship missiles. Iraqi and Iranian versions saw action during the 1990-01 Gulf War, while Italian, Greek, Spanish and Turkish versions were used to enforce UN sanctions against the former Yugoslavia.

## Variants

AB 212 ASW: basic version

AB 212LW: Turkish electronic warfare version

HA.16: Spanish designation.

## Status

In production

## Operators

Greece (navy), Iran (navy), Italy (navy), Peru (navy), Spain (navy), Turkey (navy), Venezuela (navy).

## Manufacturer

Agusta (Italy).



**Agusta-Bell AB 212ASW**

(Tom Ripley)

## Specifications (for AB 212 ASW)

### Powerplant

one Pratt & Whitney PT6T-6 Turbo Twin Pac

Power: 1075 shp (790 kW)

Max 1/1: 41 170 lb (6070 kg)

Payload: 5000 lb (2270 kg)

### Dimensions

Length: 42 ft 4 in (12.9 m)

Rotor diameter: 48 ft 2 in (14.7 m)

Height: 14 ft 10 in (4.5 m)

### Performance

Max speed: 122 mph (195 km/h)

Range: 300 nm (557 km)

### Armament

AS-12, Sea Killer 2, Sea Skua radar-guided anti-ship missiles; Mk 44, AG or MU 44 torpedoes; depth charges; machine guns

# Kawasaki OH-1 (Japan)

**Type:** Light attack and observation helicopter

**Accommodation:** Pilot, gunner/observer

## Development/History

The first military helicopter developed entirely in Japan is intended to replace the OH-1A in Japanese Ground Self Defence Force service in the early part of the next century. A mock up was revealed in 1984, and the first prototype flew two years later. Similar in appearance to the Agusta A 129, but the OH-1 features a foresting tail rotor and 1980s generation materials, sensors and weapon systems. The 1992 defence budget included funding for the first three production aircraft.

## Variants

Nil.

## Status

In pre-production.

## Operators

Nil

## Manufacturer

Kawasaki and Fuji Heavy Industries (Japan).



*Kawasaki OH-1*

## Specifications

### Powerplant

Two NHJ SH-10 turboshaft

Power: 1310 shp (1760 kW)

Max. lift: 2215 lb (1000 kg)

Payload: n/a

### Dimensions

Length: 29 ft 4 in (12 m)

Rotor diameter: 37 ft 9 in (11.6 m)

Height: 12 ft 5 in (3.8 m)

### Performance

Cruising speed: 150 mph (240 km/h)

Range: 124 nm (230 km)

### Weights

Empty: n/a

### Armament

Asahi Type 90 air-to-air missiles; anti-tank guided missiles; free-fall rockets; turret- and gun-mounted machine/guns

# PZL Swidnik W-3 Sokol (Poland)

Type: Medium-lift multi-purpose helicopter

Accommodation: Two pilots, 12 passengers

## Development/History

PZL Swidnik began to work on upgrading the old Mi-2 design during the 1980s and the result of that work, the W-3, began test flying in 1979. Production began in 1985, and it has since entered service with the Polish armed forces.

Development in 1985 armed version is underway, with the help of South Africa and Israel, to improve the export potential of the helicopter by giving customers western and eastern weapons options.

## Variants

W-3 Sokol: Standard civil and military version.

W-3L Iwaszka: Standard version with up-engined engine by 746kW (1000 shp) and capacity for 14 passengers.

W-3RM Anikonda: Polish Navy search and rescue version.

W-3U Sukomandira: Gunship version.

W-3U-1 Alligator: Proposed anti-submarine version.

W-3W: Low cost armed version for Poland.

W-3MV: Improved naval strike version.

W-3A: Improved avionics version for western markets.

W-3M: As W-3A with floatation hull.

W-3WB Huron: Armed version upgraded with assistance

from South Africa's Denel using the Denelcor weapon system.

W-3 Salon: VIP transport.

W-3 EW: Proposed electronic warfare version.

W-3 MS/MW: Proposed gunship version with tandem cockpit.

SW-5: Proposed up-engined with Pratt & Whitney F16C-970 turboshaft.

## Specifications (for Sokol)

### Powerplant

Two WSX-PZL Rzeszow PZL-10W turboshafts

Power: 1040 shp (774.2 kW)

### Dimensions

Length: 45 ft 7 in (14.2 m)

Rotor diameter: 51 ft 6 in (15.7 m)

Height: 13 ft 6 in (4.12 m)

### Weights

Empty: 7275 lb (3300 kg)

Max. LO: 14 110 lb (6400 kg)

Payload: 1470 lb (670 kg)

### Performance

Max speed: 131 kph (255 knt)

Range: 1431 nm (264 knt)

### Armament

(W-3U) Two 20 mm (35in-72) cannon (and 20 mm cannon on rear door), 21-44mm and 140mm laser guided missiles, MM14 Shotgun (M-45mm) rocket and laser beam-guided anti-tank missiles, 80032M Strela (SA-7) Guided anti-air missiles, napalm rockets, more dispersals.

### Status

In production

### Operators

Czech Republic, Poland (army/military forces), Myanmar.

### Manufacturer

PZL Swidnik, [Poland]

### PZL Swidnik W-3 Sokol

(Tim Rypke)



# Kamov Ka-25 (Russia) NATO reporting name 'Hormone'

Type: Shipborne anti-submarine helicopter

Accommodation: Two pilots, (optional) 12 passengers

## Development/History

Some 460 Ka-25s were built for service aboard Soviet Navy ships from 1966. It has now been withdrawn from Russian Navy service, but a few are operational elsewhere.

## Variants

Ka-25PL: Basic version.

Ka-25B: Proposed land-based attack helicopter.

Ka-25B 'Hormone-A': Original ASW version with search radar, MHD sensor, dipping sonar and sonobuoy launcher.

Ka-25B 'Hormone-B': Specialised version to provide long-range acquisition of electronic guidance for submarine- and ship-borne missile intercept. Partially retractable landing gear.

Ka-25T: 10, 125 missile tracking version.

Ka-25B 'Hormone-C': Specialised search and track version, without anti-submarine warfare equipment.

Ka-25BshZ: Mine warfare version.

Ka-25K: Prototype flying crane.

## Status

No longer in production.

## Operators

India (navy), Irania (navy), Syria (navy), Vietnam, Yugoslavia (navy)

## Manufacturer

Kamov Aviation (Bashkortostan/Russia) and Ulan Ude (Russia) in Kamov OKB (Russia) design.



*Ka-25B 'Hormone-A' on the Minsk*

*JarJar*

## Specifications (for Ka-25Bsh)

### Powerplant

Two Mikoyan Gorbunov turboshafts

Power: 1776 shp (1324 kW)

### Weights

Empty: 30 405 lb (1474 kg)

Max T/O: 15 073 lb (7200 kg)

### Dimensions

Length: 32 ft (9.7 m)

Rotor diameter: 50 ft 2 in (15.2 m)

Height: 17 ft 7 in (5.4 m)

### Performance

Max speed: 130 mph (210 km/h)

Range: 354 nm (650 km) with external tanks

### Armament

Anti-submarine: Hedgespores, depth charges

# Kamov Ka-27/28/32 (Russia) NATO reporting name 'Helix'

Type: Sikplurine anti-submarine helicopter

Accommodation: Two pilots, systems operator

## Development/History

The Ka-27 series has a larger fuselage than the Ka-25. The first prototype flew in 1974, and it entered frontline service with the Soviet Navy in the early 1980s. Its robust design and rugged construction have proven popular with crews.

## Variants

Ka-27PL 'Helix-A': Basic version for Soviet Navy, also known as Ka 250PL

Ka-27PS 'Helix-B': Naval search and rescue version.

Ka-27PV: Armed version of PS.

Ka-28 'Helix-A': Export version of PL.

Ka-32S 'Helix-C': Civilian utility and rescue version, with up graded avionics and search radar.

Ka-32T 'Helix-C': Civil utility version.

Ka-32K: Civil Flying Crane.

Ka-32T: Civil utility version.

Ka-31A: Fire fighting version.

Ka-32A: Civil version.

## Status

In production.

## Operators

India (Navy), Russia (Navy), Vietnam, Yugoslavia (Navy)

## Manufacturer

Kamersau Aviation (Bashkortostan/Russia) to Kamov OJSC (Russia) design



Kamov Ka-32 'Helix'

(Two Hqday)

## Specifications (Ka-28)

### Powerplant

Two Kamov V3-117V turboprops

Power: 4760 shp (3266 kW)

### Dimensions

Length: 32 ft 1 in (9.8 m)

Rotor diameter: 52 ft 7 in (16.0 m)

Height: 17 ft 8 in (5.4 m)

### Weights

Empty: 14 330 lb (6500 kg)

Max T/O: 24 240 lb (11 000 kg)

Payload: 11 023 lb (5000 kg)

### Performance

Max speed: 160 knts (270 kph)

Range: 432 nm (800 km)

### Armament

Anti-submarine torpedoes; depth charges



# Kamov Ka-29 (Russia) NATO reporting name 'Helix-B'

Type: Assault helicopter

Accommodation: Two pilots, 11 troops

## Development/History

Capitalising on the success of the Ka-27 family, Kamov United this specialist assault helicopter version in the late 1980s. It was designed to operate off the Soviet Navy's amphibious landing ships, and is considered to be the 'major AM-24', combining firepower with a troop-carrying capability.

## Variants

Ka-29B 'Helix-B': basic assault/transport version, also known as Ka-29T/B.

Ka-29M/B: Airborne early warning and surface surveillance version, redesignated Ka-31.

Ka-29K: antisubmarine and submarine version based on Ka-29B airframe.

## Status

In production

## Operators

Russian Navy

## Manufacturer

Kamov Aviation (Bashkortostan/Russia) to Kamov OJSC (Russia) design.



Kamov Ka-29

(Российская армия)

## Specifications

### Powerplant

Eng: Kamov TV3-117V turboshafts

Power: 4380 shp (3206 kW)

### Dimensions

Length: 37 ft 1 in (11.3 m)

Rotor diameter: 52 ft 2 in (15.9 m)

Height: 17 ft 8 in (5.4 m)

### Weights

Empty: 12 170 lb (5520 kg)

Max L/O: 27 775 lb (12 600 kg)

Payload: 8810 lb (4000 kg)

### Performance

Max speed: 174 mph (280 km/h)

Range: 248 nm (460 km)

### Armament

Two 7.62 mm Galling type machine guns in doors, four laser pointers; 9M114 Shturm (A)-B Spinal radar and laser-guided anti-tank missiles; long-flight rockets; 23 mm or 30 mm gun pods.

# Kamov Ka-50/52 (Russia) NATO reporting name 'Hokum'

Type: Attack helicopter

Accommodation: One pilot

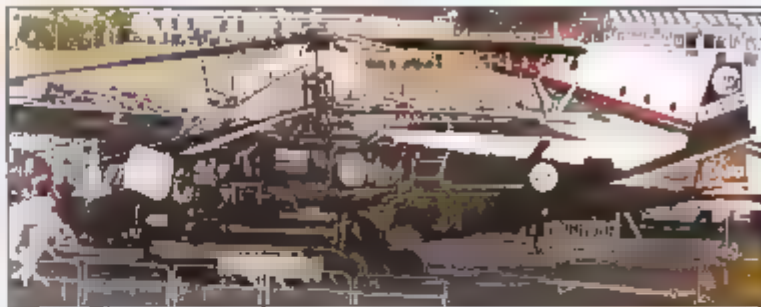
## Development/History

The Kamov OKB has had an interest in attack helicopters since the mid-1960s, when its design lost out to the Mil OKB's Mi-24 in the contest for the Soviet army's battlefield assault helicopter. Kamov resumed work in the 1970s, again with Mil as a rival, to fulfil a requirement for the Mi-24 replacement.

The Kamov Ka-50 first flew in 1987, and won the contest against the Mil's Mi-28 design due to its better agility, heavier armour and improved, however, the military establishment remained sceptical about the Ka-50's single-seat concept, so work continued on the two-seat Voskhod involved in public in 1992. The Ka-50 is now being offered for export as the 'Circus' or 'Helicopter Soldier', although it has also been called the 'Black Shark' in promotional material.

The collapse of the Russian defence budget in recent years has left Russian army aviation in limbo: neither the Ka-50 nor Mi-28 have entered front-line service, although 37 production versions of the Ka-50 have been completed and work continues on a new version, with a multi-attack and two-seater variant flying in prototype form.

The Ka-50 design is revolutionary, with the cockpit now allowing the traditional tail rotor to be dispensed with. Designed for a single-seat design, Kamov OKB had to incorporate a significant number of automation devices, such as helmet-mounted sight, head-up displays and computer navigation devices. Defensive equipment includes self-sealing fuel tanks and armoured engines. The pilot has an ejection seat, which



*Kamov Ka-50/52 Votvovolt*

*(Tom Hopley)*

## Specifications (for Ka 50)

### Powerplant

Two Kamov TV3-117AK turboshafts  
Power: 4300 shp (3205 kW)

### Dimensions

Length: 42 ft 6 in (12.9 m)  
Rotor diameter: 47 ft 7 in (14.5 m)  
Height: 16 ft 2 in (4.9 m)

### Weights

Empty: 6100  
Max T/O: 23 610 lb (10 690 kg)  
Maxload: 5670 lb (2560 kg)

### Performance

Max speed: 180 mph (310 km/h)  
Endurance: four hours with auxiliary tanks

### Armament

One Vortex 2642 cannon, 9K120 Vokh M (AT-16) laser beam riding guided anti-tank missile; 9K114 Shturm (AT-6 Spinal) rifle and laser-guided anti-tank missiles; Kh-25MP (AS-12 Kopylov) air-to-surface missiles; two flight nuclear pods; 80 mm and 100 mm gun pods; R-60M (AA-8 Armer) or R-73 (AA-11 Archer) heat-seeking air-to-air guided missiles

## Kamov Ka-50/52 Werewolf/Alligator (Russia) NATO reporting name 'Hokum'



first triggers an explosive device to blow off the rotor blades prior to firing the pilot safely away from the helicopter

### Variants

VJ00: Initial prototype

Ka-50 Werewolf/Black Shark/Helicopter Soldier

(unofficially 'Hokum-A')/V-60Sh: Basic single-seat version.

Ka-52 Alligator (unofficially 'Hokum-B')/V-60Sh2: Two-seat version.

### Status

In limited production

### Operators

Russia (only).

### Manufacturer

Progress Aerospace Aviation Co (Russia) to Kamov OKB (Russia) design.

**Kamov Ka-50/52 Werewolf**

*(Tim Ripley)*

# Mil Mi-2 (Russia/Poland) NATO reporting name 'Hoplite'

Type: Light helicopter

Accommodation: One or two pilots, eight passengers

## Development/History

Under Warsaw Pact centralised defence plans, the PZL Swidnik plant was nominated as the sole production site for the Mil Mi-2 design. The first Polish-built Mi-2 flew in 1965, and more than 5200 were built up until production ceased in 1981. The light utility helicopter saw extensive service with Soviet and Warsaw Pact armed forces, including combat operations in Afghanistan and other trouble spots. Civil versions have been licence produced in the USA.

## Variants

Mi-2T: Unarmed utility/transport version

Mi-2M: Dual control trainer

Mi-2M: Agricultural crop sprayer

Mi-2S: Medical evacuation version

Mi-2US: Helicopter armed version with 23 mm machine gun and eight rocket pods

Mi-2UBN: Submarine Anti-submarine version with 23 mm cannon and two depth rocket pods

Mi-2UBR: Anti-tank version with Maljutka guided missiles

Mi-2UBM: up-armed version with 9M32 Strela 2

Mi-2C Chetka: Chemical and nuclear survey and smoke layers

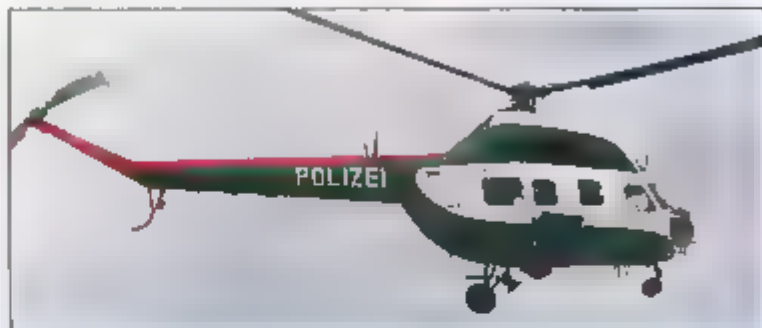
Mi-2B: Upgraded version with improved electronics for export to Middle East

Mi-2BM: naval rescue version

Mi-2B: Reconnaissance version

Mi-2RS: Chemical reconnaissance version

Mi-2S: Dual control trainer



Mil Mi-2 'Hoplite'

(Tim Ripplert)

## Specifications (for Mi-2T)

### Powerplant

Two Klimov GTD 150 turbo-shafts

Power: 800 shp (596 kW)

### Dimensions

Length: 37 ft 4 in (11.4 m)

Rotor diameter: 42 ft 6 in (14.5 m)

Height: 12 ft 3 in (3.7 m)

### Weights

Empty: 5295 lb (2402 kg)

Max T/O: 8957 lb (4063 kg)

Payload: 1762 lb (800 kg)

### Performance

Max speed: 124 mph (200 km/h)

Range: 237 nm (440 km)

### Armament

Four 69mm rockets; gun and cannon pods;  
9M14M Maljutka (AT-3 Sagger) wire-guided  
anti-tank missiles; 9M32 Strela 2 (SA-7 Grail)  
air-to-air missiles



Mi-2FM: Survey version

Mi-2B: Airborne command post

Mi-2 Platan: Mine-laying version

Ussr-2: Reconnaissance trainer

Variant 51: East German reconnaissance version

Variant 66: East German maritime version

Variant 96: East German version

Green/Kelly Hawk: Vets set with Allison 250-C20B turboshaft

Also known as Kania 'Hudex 1'

Spitfire: Training US-built version

## Status

Production suspended

## Operators

Bolivia (air force), Czech Republic, Estonia, Ghana, Guinea (Republic), Iraq, Latvia, Libya, Lithuania, Nicaragua, Poland (army/air force), Romania (air force), Slovakia (air force), Slovakia (army), Slovakia (air force), Ukraine, USA (army).

## Manufacturer

PLI Sweden (Poland) and Sikorski Helicopter Company (USA)  
as a Mil Mi-2 (Russian design)

**Left**  
**Mil Mi-2 'Hoplite'**  
(Tim Ripley)

**Right**  
**Mil Mi-2 'Hoplite'**  
(Tim Ripley)



# Mil Mi-6 (Russia) NATO reporting name 'Hook'

Type: Heavy-lift helicopter    Accommodation: Two pilots, flight engineer, navigator, radio operator, 65-75 troops, 41 stretchers

## Development/History

Mil's giant heavy-lift helicopter made its first flight in 1957, and quickly set new standards in load-carrying capacity. The largest helicopter of its generation, the Mi-6 was subsequently served with the Soviet Army in Europe and Afghanistan.

## Variants

Mi-6 'Hook-A': Basic version.  
Mi-6P: Civilian passenger version.  
Mi-6L: Military utility version.  
Mi-6VKP/VZP: 'Hook-B': Command/EW version.  
Mi-6M15/AM: 'Hook-C': Command type also called Mi-22.  
Mi-6PS: Military version version.  
Mi-6PZh/Plz: Fire-fighting version.  
Mi-6S: Medical evacuation version.  
Mi-6LP: Lumber-hauler version.  
Mi-6TZ: Fuel transporter.

## Status

No longer in production

## Operators

Algeria, Egypt, Ethiopia, Iraq, Laos, Peru (military force), Poland (air force), Russian Army, Syria (air force), Vietnam.

## Manufacturer

Komintern (Factory 160) (Russia) and Factory No 77 (Russia) to Mil OKb (Russia) design.



Mil Mi-6 'Hook'

(Tim Ripley)

## Specifications (for Mi-6T)

### Powerplant

Two Aviarotor-Volynets D-26VM turboshafts

Power: 11 850 shp (8600 kW)

### Dimensions

Length: 108 ft 10 in (33.2 m)

Rotor diameter: 114 ft 10 in (35 m)

Height: 32 ft 4 in (9.86 m)

### Weights

Empty: 10 055 lb (27 240 kg)

Max T/O: 44 657 lb (30 400 kg)

Payload: 21 450 lb (12 000 kg)

### Performance

Max speed: 186 mph (300 km/h)

Range: 540 mi (1000 km)



# Mil Mi-8/17 (Russia) NATO reporting name 'Hip'

Type: Medium-lift helicopter

Accommodation: Two pilots, optional flight engineer, 24 troops, 12 stretchers

## Development/History

The Mi-8 was the work horse of both the Soviet Union's armed forces and their Communist bloc allies from the mid 1960s. Since the demise of the Soviet Union, the basic soundness of the design and its low price, has enabled it to carve a major share for itself in the world helicopter market. Although lacking the pedigree of western machines, the plate-mixed Mi-8 embodies a useful carrying capacity with the performance to allow it to operate in the most extreme climate regimes.

The Mi-8 first flew in 1968, and has been continually improved throughout its long production life. The most significant improvement was the fitting of the superevolved Mi-8MT/PV versions, which was designated Mi-17 for export customers. This version proved its worth in the hot and high conditions experienced during the 1979-82 Afghan war. The bloody conflicts on the fringes of the old Soviet empire and in the former Yugoslavia have seen the Mi-8 employed extensively in Europe in war zones since 1991. The United Nations has also hired numerous Mi-8s to support its peace keeping and humanitarian operations. To date, some 13,000 have been built for home and more than 60 export customers.

## Variants

Mi-8 'Hip-A': Single engine prototype.

Mi-8 'Hip-B': twin-engined prototype powered by Klimov TV2 turbo-shafts.

Mi-8T 'Hip-C': Standard production version, powered by two Klimov engines, each rated to 1265 kW (1700 shp). Capable



Mil Mi-8TV 'Hip-H' on UN duty in Croatia

(Jim Hopley)

## Specifications (for Mi-8MT)

### Powerplant

Two Klimov TV3-117MT turbo-shafts

Power: 1016 shp (750 kW)

### Dimensions

Length: 59 ft 1 in (18.17 m)

Rotor diameter: 60 ft 10 in (12.1 m)

Height: 18 ft 6 in (5.65 m)

### Weights

Empty: 14 500 lb (6790 kg)

Max TOW: 26 455 lb (12 000 kg)

Payload: 8070 lb (3660 kg)

### Performance

Max speed: 155 mph (250 km/h)

Range: 515 mi (830 km) with auxiliary tanks

### Armament

Door-mounted 12.7 mm machine gun; 9M17 (Ataka (AT-2 Swatter)) and 9M14 (Malyuk (AT-3 Sagger)) wire-guided anti-tank missiles; 9M14 Shturm V (AT-6 Spall) radio- and laser-guided anti-tank missiles; 9M120 Vihor (AT-12 Laser) air-to-ground guided anti-tank missile; 9M39 Igla V (SA-18 Grouse) air-to-air missile; free-flight rocket guns

## MI MI-8/17 (Russia) NATO reporting name: 'Hip'

of being armed with free-flight rocket pods. AT/FT (Attacker/Forward) variants.

MI-8PS: Passenger and VIP transport version, also known as Mi-8M1, 4 or PL.

MI-BTPS: Antarctic transit and command version.

MI-8M1P1V: Russian military designation for up-engined version with TV3-112M1 turboshafts. TV has seven

equipment changes. Ulan Ube-8A version known as Mi-8M1/Mi-171. Mi-8 M1/M1V 1/-2/-3 are conversions to Mi-17 standard with part tail rotor.

MI-8MTV: TV3-117MA powered version, with pressurized cabin.

MI-8TB/TV 'Hip-E': Armed version with 12,7 mm machine gun in nose and pylons-mounted Falanga missiles.

MI-8TBK 'Hip-F': Armed export version with six launch rails for Malyska missiles.

MI-8M: Art accident investigation version.

MI-8M/R: Increased range/Artillery spotting version.

MI-8MPs: Search and rescue version.

MI8V2PU or VPK: Antarctic radio or command post version.

MI-8P4 'Hip-D': Antarctic command post version.

MI-8FS: 'Hot 41' high desert version.

MI-8VKP/VyPU 'Hip-G': Airborne command post and radio relay version.

MI-8SMV 'Hip-J': Communications jammer/ELINT version.

MI-8PPA 'Hip-K': Export electronic warfare version.

MI-8PD: Polish airborne command post version.

MI-8MA: Arctic/polar exploration version.

MI-8MB: Military ambulance versions, also known as Mi-8T sanitaria.



**MI MI-8TV 'Hip-H' of the Ukrainian Army Aviation on UN duty ■ Croatia**  
(Tim Ripley)



**Mil Mi-8M 'Hip-H' of Iraqi Air Force**

*(Top display)*



**Mil Mi-17M 'Hip-H'**

*© Peter Dapkinoff*



- Mi-8HC: Liquid-methane fuel version, with external tanks.
- Mi8-BAMTSc: Night attack and combat rescue version with Shturm and Vite guided missiles.
- Mi-17 'Hip-H': Export designation for up-engined Mi-8MT/17/AM version with TV3-117M1 turboprops.
- Mi-17P/P1/P2/P3 'Hip-H (W)': Export radio jamming version with large jamming box antennas on either side of fuselage. Russian version designated Mi-8MT150/M150P/M117P1A (P1P/AM17i/M117i/M17i/M17i).
- Mi-17Z-2: Czech electronic warfare version.
- Mi-17M1: Export version, with TV3-117M1 engines, new clamshell rear cargo doors and loading ramp.
- Mi-17M2: Export version with new engines.
- Mi-17-3M: High altitude operations version with TV3-117M1 engines.
- Mi-30: Proposed Korean-built Mi-17-1 version.
- Mi-17-IV: Military transport and gunship version, with TV3-117M1 engines.
- Mi-17-IVA: Heavy hospital version.
- Mi-172 (Mi-17M/V): Export version to Mi-8 MTV-3 standard.
- Mi-17V: Export passenger version.
- Mi-18: 4r-ovod designation for original prototype, new cargo version.
- Mi-19: Similar to Mi-3 airframe command post.

**Mil Mi-8T 'Hip-C' of Croat Air Force  
seen over Bosnia**  
*(Tim Ripley)*

## Status

In production

## Operators

Afghanistan, Algeria, Angola, Argentina, Azerbaijan, Bangladesh, Belarus, Bosnia-Herzegovina, Burkina Faso, Bulgaria (air force), Cambodia, China, Colombia, Croatia, Cuba, Czech Republic, Executive Outcomes (South Africa), Egypt, Estonia, Ethiopia, Finland, Germany (Army), Hungary, India (air force), Indonesia (air force), Iraq, Kazakhstan, Laos, Libya (air force), Lithuania, Macedonia, Mali, Maldives, Mongolia, Mozambique, Mexico (Army), Nicaragua, North Korea, Pakistan (Army), Peru (Army/Air Force), Poland (Army/Air Force), San Marino, Russia (Army/Air Force), Romania (air force), Russia (Army/Air Force), Serbia (Army), Slovakia, Sri Lanka, Sudan, Syria (air force), Tajikistan, Turkey (Army), Uzbekistan, Ukraine (Army/Air Force), Venezuela, Vietnam, Yemen, Yugoslavia (air force), Zambia, Georgia, USA (Army), United Nations.

## Manufacturer

Kuznetsov Helicopter Plant (Tatarstan), Mil Moscow Helicopter Plant (Russia), Progress Aerospace Aviation Co (Russia), Ural Aviation Plant (Russia), Daewoo (Korea) for OXB MD (Russia) design.



MIL MI-8 AMTSB

(Tim Ripley)



MIL MI-17MD

(Tim Ripley)

# Mil Mi-14 (Russia) NATO reporting name 'Haze'

Type: Land-based ASW helicopter

Accommodation: Two pilots, sonar helicopter, MAD operator

## Development/History

The Mi-14 is an amphibious version of the Mi-8 developed for the Soviet Navy as a shore-based ASW and rescue helicopter. The first prototypes flew in 1972, and it has since been exported to a number of post-Soviet states.

## Variants

V-14: Prototype.

Mi-14PL 'Haze-A': ASW version with dipping sonar, search radar, retractable search radar and sonobuoy dispenser. The TV3-117 engine, rated to 1417 kW (1900 shp), was adopted during the later stages of production.

Mi-14PLM: Later version with better engines and systems.

Mi-14MT 'Haze-B': Mine sweeper version produced.

Mi-14PS 'Haze-C': Search and rescue version with mine search light and anti-submarine gear removed.

Mi-14PK 'Haze-A': Polish rescue training version.

Mi-14 Eliminator III: MI converted to fire bomber.

## Status

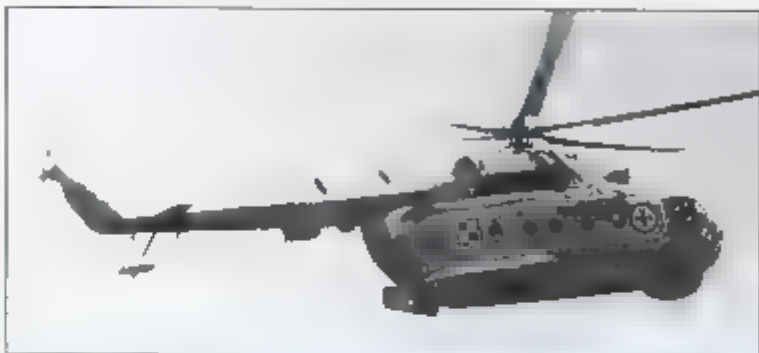
No longer in production.

## Operators

Bulgaria (navy), Cuba, Ethiopia, Libya (navy), North Korea, Poland (navy), Romania (navy), Russia (navy), Syria (navy), USA (army), Yugoslavia (navy).

## Manufacturer

Kazan Helicopter Plant (Tatarstan) to Mil OKB (Russia)



Mil Mi-14PS 'Haze-C'

(Polish MoD)

## Specifications (for Mi-14PL)

### Powerplant

■ 1x Klimov TV3-117A turboshafts

Power: 2400 shp (1736 kW)

Max T/O: 30 665 lb (14 000 kg)

Payload: n/a

### Dimensions

Length: 60 ft 3 in (18.4 m)

Rotor diameter: 69 ft 10 in (21.3 m)

Height: 22 ft 9 in (6.9 m)

### Performance

Max speed: 143 mph (230 km/h)

Range: 612 nm (1135 km)

### Armament

Anti-submarine torpedoes, depth charges, four machine guns.

### Weights

Empty: 25 900 lb (11 750 kg)

# Mil Mi-24 (Russia) NATO reporting name 'Hind'

Type: Attack/assault helicopter

Accommodation: Pilot (rear), weapons operator (front), optional flight engineer, eight troops

## Development/History

This distinctive Soviet assault helicopter was developed by Mil OKB in response to American experiences in Vietnam. Sometimes called a 'flying tank' because it was the first attack helicopter to feature heavy armour and be armed with a large calibre cannon. In Soviet/Russian service it is nicknamed the 'hunchback'.

The first prototype made its maiden flight in 1970, but this version lacked a full glass, or 'green house', cockpit, unlike the more familiar tandem layout of later models. In 1974 the first production versions were spotted operating with Soviet troops in East Germany and they were soon in widespread service throughout Eastern Europe.

The events of Afghanistan in 1979 gave the Mi-24 its first combat experience, and Soviet pilots soon came to value its heavy armoured protection. Only the arrival of US-made Stinger missiles in the hands of Mujahideen rebels threatened Soviet air superiority, so a crash programme to fit defensive systems to the Mi-24 was begun.

With the fall of the Soviet Union, the Mi-24 has seen extensive service in the wars of the Caucasus. Russian Army Aviation used them to suppress the rebellion of Chechnya in 1994. Budget cuts mean Russian plans to replace the Mi-24 have yet to come to fruition, so it will have to soldier on for many years to come. In fact the Mi-24's appeal to export customers, western variants and colours have been integrated into the latest new-build versions.

## Variants

Y-24/A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UU, UV, UW, UX, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ.



Mil Mi-24K 'Hind-CZ' of the Ukrainian Army Aviation

(Tim Hipley)

## Specifications (for Mi-24P)

### Powerplant

Two 8-cyl 193-112 hp (139.5 kW) turbo-shafts

Power: 4,000 shp (3,200 kW)

### Dimensions

Length: 57 ft 5.5 in (17.5 m)

Rotor diameter: 56 ft 9 in (17.3 m)

Height: 15 ft 11 in (4.7 m)

### Weights

Empty: 10,070 lb (4,570 kg)

Max T/O: 24,450 lb (11,090 kg)

Max L/O: 5,290 lb (2,400 kg)

### Performance

Max speed: 200 mph (320 km/h)

Range: 540 mi (870 km) with auxiliary tanks

### Armament

12.7 mm GSh-23 gun pod or 12.7 mm GSh-23 gun pod in nose; 9M17 Falanga (AT-2 Sagger) wire-guided anti-tank missile; 9M114 Shturm (AT-6 Spiral) radio- and laser-guided anti-tank missile; 9M120 Vahle (AT-16) laser anti-tank guided missiles; 9M30 Igla-M (SA-10 Grouse) and 9A-2200 jet-burner missiles; four 81 mm rocket pods; 23 mm or 12.7 mm gun pods; twin 30 mm GSh-30-2 cannons; 30 mm grenade launcher; barrel; chemical weapons; mine dispensers





engines, rated to 1700 shp.

Mi-24A/H 'Hind-A': Original production version with green house' front cabin, starboard tail rotor, TV-3-117 engines and Falanga missiles.

Mi-24B 'Hind-C': Unarmed training version w/ 'Wood-A'.

Mi-24R 'Hind-D': Last version to have tandem cockpit, 12.7 mm cannon and Falanga missiles.

Mi-24HD: Dual control trainer with knee detector.

Mi-25: Export version of Mi-24D.

Mi-24V 'Hind-E': Detachable rotor stand and a dual Soloviev motor. Powered by TV-3-117A engines. Known as Mi-24V to Polish service; export version Mi-25.

Mi-24P 'Hind-F': Version of Mi-24D armed with fully-mounted twin 30 mm cannon. Mi-25P export version.

Mi-24VP: Mi-24V with twin 23 mm cannon in nose turret. Mi-25VP export version.

Mi-24R, RA, Rkh (Rch) or RKA Hind G: Chemical and nuclear warfare/suppressing version.

■ Mi-24K Hind G-2: Artillery fire correction version.

Mi-24VM: Night attack version with western sensor and new titanium rotor head.

Mi-24UM: Export night attack version with western sensor, avionics and new Mi-28 style titanium rotor head.

Mi-35U: Unarmed export trainer.

Mi-24PS: Police/gara-military version.

Mi-24E: Environmental research ground.

**Left: Mi-24V 'Hind-E'**

*(Tim Ripley)*

**Right: Mi-24V 'Hind-E'**

*(Tim Ripley)*





## Status

In production.

## Operators

Afghanistan, Algeria, Angola, Armenia, Azerbaijan, Belarus, Bulgaria (all force), Cambodia, Canada, Czech Republic, Executive Outcomes (South Africa), Ethiopia, Finland, Hungary, India (all force), Iran, Kazakhstan, Laos, Libya (all force), Mongolia, Mozambique, Peru (all force), Poland (all force), Russia (all force), Rwanda, Sierra Leone, Slovakia, Sri Lanka, Sudan, Syria (all force), Tajikistan, Uzbekistan, Ukraine (all force), Vietnam, Yemen, Georgia, USA (all force)

## Manufacturer

Boznerol (Russia) and Progress Aerospace Aviation Co (Moscow) to Mil USA (Russia) design

**Left: Mil Mi-24W 'Hind-E' of the Polish Air Force**

(Tim Ripley)

**Right: Mil Mi-36**

(Tim Ripley)



# Mil Mi-26 (Russia) NATO reporting name 'Halo'

Type: Heavy-lift helicopter

Accommodation: Two pilots, flight engineer, navigator, 80 troops, 60 stretchers

## Development/History

Designed to replace the Mi-8, the Mi-26 is the most powerful helicopter in the world. It has a cargo carrying capacity equivalent to that of the C-130 transport aircraft. First flown in 1977, the Mi-26 entered Soviet Army Aviation service in 1982. The UN has chartered a number to support operations in Somalia and the former Yugoslavia.

## Variants

Mi-26: Base version.

Mi-26C: Civil version with D-136 engines.

Mi-26MS: Heavy hospital version.

Mi-26M: Planned upgrade.

Mi-26TZ: Tanker.

Mi-26M: Upgraded version with D-137 engines.

Mi-26P: Proposed 20-seat passenger version.

Mi-26TS: Export version.

Mi-26A: Upgraded navigation systems.

Mi-26TC: Wide-bodied version with D-136 engines.

## Status

In production

## Operators

India (Army), Peru, Russia (Army), Ukraine (Army), United Nations

## Manufacturer

Rosvertol (Russia) to Mil OKB (Russia) design



Mil Mi-26 'Halo'

(Don Ripley)

## Specifications (for Mi-26)

### Powerplant

Two ZMKB Progress D-135 free-turbine turbo shafts

Power: 225/2 shp (165/14 kW)

### Dimensions

Length: 110 ft 6 in (33.7 m)

Rotor diameter: 105 ft (32 m)

Height: 26 ft 8 in (8.2 m)

### Weights

Empty: 62 470 lb (28 200 kg)

Max L/O: 123 450 lb (56 000 kg)

Payload: 44 090 lb (20 000 kg)

### Performance

Max speed: 183 mph (295 km/h)

Range: 432 min (800 km)

# Mil Mi-28 (Russia) NATO reporting name 'Havoc'

Type: Attack helicopter

Accommodation: Pilot (rear) and gunner (front)

## Development/History

Superficially similar in appearance to the American Apache, the Mi-28 made its first flight in 1992. Since the aircraft lost the Soviet Army Aviation attack helicopter contest to the Ka-50, the Mi-28 has had a troubled history. The Russian Army Aviation has reportedly been persuaded to place an order for the aircraft, but financing difficulties have so far prevented series production taking place. The aircraft has been undergoing almost continuous development for over 15 years to allow it to fly armed attack missions at very low altitudes. Latest versions on display at western airshows include state of the art night vision sensors and mast-mounted sights.

## Variants

Mi-28: Basic version.

Mi-28N: Night attack version with improved sensors and mast-mounted sight.

## Status

In low rate production.

## Operators

Russia (primary).

## Manufacturers

Kayserfab (Russia) to a Mil OKB design.



Mil Mi-28N 'Havoc' with rotor mounted sight

(Tom Ripley)

## Specifications (for Mi-28)

### Powerplant

Two Klimov TV3-117VM turboshafts

Power: 4,800 hp (3,546 kW)

### Performance

Max speed: 186 mph (300 km/h)

Range: 240 nm (440 km)

### Dimensions

Length: 55 ft 3 in (16.85 m)

Rotor diameter: 56 ft 5 in (17.2 m)

Height: 15 ft 9 in (4.82 m)

### Armament

One 2A42 30 mm nose-mounted cannon; 9M30 light V (SA-11 Stinger) and 9K220 air-to-air missiles; 9M114 Shtrum (AT-6 Spiral) anti-tank guided missile; 9M120 Vokh-M (AT-16) laser beam riding guided anti-tank missiles; free-flight rockets.

### Weights

Empty: 15,432 lb (7,000 kg)

Max T/O: 25,353 lb (11,500 kg)

Warload: 4,000 lb (1,814 kg)

# Mil Mi-34 (Russia) NATO reporting name 'Hermit'

Type: Light utility helicopter

Accommodation: Two pilots, two passengers

## Development/History

Designed as a light utility, observation, training and liaison helicopter for military, police, border guard and civil use, the Mi-34 made its maiden flight in 1986. It was the first Soviet helicopter to be capable of executing a loop or roll. Production began in 1987, but funding problems slowed deliveries after six had been built. By 1992 production resumed after a corporate restructuring.

## Variants

Mi-34: Basic version.

Mi-34y or YAZ: Two-engineered version, fitted with VAZ-430 twin turboprop engines, each rated to 160 kW (222 shp).

## Status

In production.

## Operators

Russia (air force/navy).

## Manufacturer

Progress Arsenyev Aviation Co (Russia) and VAF Motor Car Works (Russia) in MIL (OKB) (Russia) design.



Mi-34

(ITAR/TASS)

## Specifications (for Mi-34)

### Powerplant

VAZS (Volcomsky) M-14V-26 air-cooled radial engine

Power: 320 shp (233 kW)

### Dimensions

Length: 28 ft 7 in (8.71 m)

Rotor diameter: 32 ft 9 in (10 m)

Height: 10 ft 1 in (3.2 m)

### Weights

Empty: n/a

Max. T/O: 2970 lb (1350 kg)

### Performance

Cruising speed: 112 mph (180 kmh)

Range: 224 min (360 km)

# Mil Mi-38 (Russia)

Type: Medium lift helicopter

Accommodation: Two pilots, 32 passengers

## Development/History

Conceived as the replacement for the Mi-8/17 in the medium transport roles, the Mi-38 programme has not really got beyond the prototype stage because of lack of funding. Development began back in the mid-1990s and a maiden flight was expected for 1993, but did not occur. It bears many similarities to the UH-101 Merlin.

The helicopter has many unique features, including a six-bladed main rotor, a delta 4 type tail similar to the Mi-26's, CRT cockpit displays and extensive use of composite materials. Cargo can be carried under slung or positioned on the cabin via clam-shell rear doors and a loading ramp. Eurocopter are working jointly with Mil (OKB) and Kazan Helicopters on the programme.

## Variants

Nil.

## Status

In pre-production.

## Operators

Nil.

## Manufacturer

Kazan Helicopter Plant (Tatarstan) to Mil OKB (Russia) design.



*Model of the proposed Mi-38*

*(Paul Jackson)*

## Specifications (for Mi-38)

### Powerplant

Two Klimov TV3-117V turboshafts

Power: 4636 shp (3456 kW)

Max T/O: 31 000 lb (14 000 kg)

Payload: 11 020 lb (5000 kg)

### Dimensions

Length: 64 ft 7.5 in (19.70 m)

Rotor diameter: 60 ft 8 in (18.60 m)

Height: 30 ft 10 in (9.43 m)

### Performance

Cruising speed: 155 mph (250 km/h)

Range: 700 nm (1300 km)

### Armament

Nil

### Weights

Empty: 1470

# Mil Mi-40 (Russia)

Type: Assault transport helicopter

Accommodation: Two pilots, ■ troops

## Development/History

Intended as an assault transport version of the Mi-26 attack helicopter. It shares many of the systems of the Mi-26, including engine transmission, main deck fuel injectors.

## Variants:

Nil.

## Status

In pre-production.

## Operators

■

## Manufacturer

Assumed to be Mil PKB (Russia) design.



*Model of the proposed Mi-40*

*(Paul Jackson)*

## Specifications (for Mi-40)

### Powerplant

Two Klimov TV3-611MA turbo-shafts

Power: 4,300 shp (3,206 kW)

Max T/O: 25 1,370 lb (11 402 kg)

Payload: 20 681 lb (1000 kg)

### Dimensions

Length: 54 ft 5 in (16.62 m)

Rotor diameter: 56 ft 5 in (17.20 m)

Height: 14 ft 5 in (4.40 m)

### Performance

Cruising speed: 100 mph (295 km/h)

Range: n/a

### Weights

Empty: 16 920 lb (7675 kg)

### Armament

Anti-tank guided missiles; free-flight rockets; gun pods



# Denel Aviation CSH-2 Rooivalk (South Africa)

Type: Attack helicopter

Accommodation: Pilot (rear), co-pilot/gunner (front)

## Development/History

South Africa's Rooivalk (Red Kestrel) has its origins in an attack helicopter programme that commenced in 1981 in order to develop a successor to the Alouette III gunships then being used in Angola and South West Africa. The South African Air Force has ordered a squadron's worth, but defence cuts have put the order in doubt. Malaysia's new army aviation echelon may well be the first customer for the Rooivalk.

## Variants

XDM: Experimental Development Model

CSH-2: basic production model

ADM: Advanced development model

## Status

In pre-production.

## Operators (proposed)

Malaysia (army), South Africa (air force).

## Manufacturer

Atlas Aviation/Denel Aviation (South Africa).



Denel Aviation Rooivalk

(Denel Aviation)

## Specifications (for CSH-2)

### Powerplant

Two Turboprop turbo-shafts

Power: 4000 shp (2987 kW)

Weighted: 3077 lb (1371 kg)

### Performance

Max speed: 197 mph (309 km/h)

Range: 507 nm (940 km); 220 nm (395 km) with external fuel

### Dimensions

Length: 51 ft 7 in (16.5 m)

Rotor diameter: 49 ft 5 in (15.08 m)

Height: 15 ft (4.6 m)

### Armament

One 20 mm BA-1 Ratler cannon; ZT-3 Swift, ZT-35 or ZT-6 Mkukpa laser-guided anti-tank missiles; VBC Davier or Kukri air-to-air missiles; free-fight rockets

### Weights

Empty: 11 600 lb (5270 kg)

Max LTO: 20 773 lb (9400 kg)



*Denel Aviation Rooivalk*

*(Denel Aviation)*

# Denel Aviation Oryx (South Africa)

Type: Transport helicopter

Accommodation: Two pilots, 20 passengers

## Development/History

This South African-developed version of the Puma is being aggressively marketed by Denel to users needing helicopters optimised for 'hot and high' bush conditions. In many ways it is similar to the Super Puma because it uses Makila powerplants. But Denel has gone further by making the tail section, plus tailflying in the provision for an extensive array of magazines. Previously known as Geirshoe.

## Variants

Option 1: Gun turret version.

Option 2: Side-mounted free-flight rocket launchers.

Option 3: Nose-mounted free-flight rocket launcher.

Option 4: Anti-aircraft gunship.

## Status

In production.

## Operators

South Africa.

## Manufacturer

Atlas Aviation/Denel Aviation (South Africa)



*Make up of the stabilised sighting system fitted to an Oryx (API)*

## Specifications (for Oryx)

### Powerplant

Two turbofans: Salsola 5A1 free turbines

Power: 325-kW (2800-hp)

Max T/O: n/a

Payload: n/a

### Dimensions

Length: 59 ft 6 in (18.15 m)

Rotor diameter: 49 ft 2.5 in (15 m)

Height: 16 ft 10.5 in (5.14 m)

### Performance

Cruising speed: n/a

Range: 300 nm (561.6 km)

### Armament

Free-flight rockets; 6 or 16 Zl-3 Swift or Zl-35 laser-guided anti-tank missiles; Dart or Viper air-to-air missiles; 20-mm cannon gun turret

### Weights

Empty: n/a

# Westland Wasp (UK)

Type: Light general-purpose helicopter

Accommodation: One pilot, three passengers

## Development/History

Once the primary shipborne small helicopter of the British Royal Navy, the Wasp is now obsolete and is in the process of being phased out of service by its last remaining users.

## Variants

Wasp HAS 1: Shipborne version.

## Status

No longer in production.

## Operators

Indonesia (navy), Malaysia (navy), New Zealand (air force)

## Manufacturer

Sikorsky (UK)/Westland Helicopters (UK)



*Westland Scout AH Mk 1*

*(Dor Ripley)*

## Specifications

### Powerplant

One Rolls-Royce Bristol Siddeley 503 turbo-shaft

Power: 710 shp (529 kW)

Max T/O: 5,500 lb (2,495 kg)

Payload: 1,500 lb (680 kg)

### Dimensions

Length: 30 ft 4 in (9.2 m)

Rotor diameter: 32 ft 3 in (9.8 m)

Height: 11 ft 8 in (3.6 m)

### Performance

Max speed: 120 mph (193 km/h)

Range: 263 mi (408 km)

### Weights

Empty: 3,452 lb (1,566 kg)

### Armament

Mk 46 torpedoes; AS12 wire-guided missiles;

Mk 44 depth charges

# Westland Lynx (Army version) (UK)

Type: Light multi-purpose military helicopter

Accommodation: Pilot, observer/gunner, 10 troops

## Development/History

The British Army's primary light helicopter is another product of the Anglo-French Helicopter Agreement of 1967. Britain's Westland brought Lynx design to the table, and it duly became responsible for its development, production and marketing. Some 413 AH 1s were built for the British Army with skid landing gear, but export sales proved elusive. The British Army Air Corps and Royal Marines/Royal Navy later converted their fleets to armed helicopters (HE LARMS) by fitting US-made TOW anti-tank missiles. A further 24 AH 1 light battlefield helicopter variants were produced from 1988 to equip 24 Armoured Brigade.

## Variants

AH 1: Original British Army utility version. Some examples armed with TOW missiles.

AH 16T: Intermittent version until AH 7 developed.

AH 1a: 'perpetual' version.

AH 6: Proposed Royal Marines version, not produced.

AH 21: British Army upgraded armed helicopter (HE LARMS) version with eight TOW missile tubes.

AH 61: British Army light battlefield helicopter version with Rolls-Royce Gem 42-1 powerplant, each rated at 846 kW (1136 hp), triple under carriage and QERP rotor blades.

Battlefield Lynx: Proposed export version with provision for Hellfire or HOT anti-tank missiles.

Battlefield 600: Proposed export version with UTEC T800 engines.

Mk 24/26: Proposed Iraqi export version.

Mk 32: Proposed Egyptian export version.



Westland Lynx AH Mk 9

(The Registry)

## Specifications (for AH 1)

### Powerplant

Two Rolls-Royce Gem 2 turboshafts

Power: 1400 shp (1342 kW)

Max 1/3: 10 000 lb (4535 kg)

Payload: 2000 lb (907 kg)

### Dimensions

Length: 49 ft 0 in (15.2 m)

Rotor diameter: 42 ft (12.8 m)

Height: 11 ft 6 in (3.5 m)

### Performance

Cruising speed: 161 mph (259 km/h)

Range: 340 nm (630 km)

### Weights

Empty: 6040 lb (2740 kg)

### Armament

TOW and Improved TOW wire guided anti-tank missiles; 12.7 mm or 20 mm door or gun mounted machine guns; free-flight rockets

## **Westland Lynx (Army version) (UK)**

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Mk 03: Proposed Saudi export version.

Mk 04: Proposed Italian export version.

Mk 06: Proposed UAE export version.

Lynx AH1: Experimental advanced compound helicopter with wings for additional lift.

### **Status**

No longer in production.

### **Operators**

UK (Army/Army).

### **Manufacturer**

Westland Helicopters (UK)

**Westland Lynx AH.Mk 7**

(Tim Ripley)



# Westland Lynx (Navy version) (UK)

Type: Light multi-purpose naval helicopter

Accommodation: Pilot, observer/gunner, 10 troops

## Development/History

Westland's development of the naval Lynx has proved far more successful than its effort with the army version, by addition to the 51 bought by the British Royal Navy, more than 200 have been sold for export, with new orders continuing to be secured.

Armed with the Sea Skua missile, the Lynx proved a potent ship killer both during the Falklands conflict and the 1991 Gulf War. After the Falklands, the Royal Navy began major upgrade programmes to improve the rotor blades, powerplant, sensors, weapon systems and defensive aids. This programme has continued through to the current HAS 2 standard, which is dubbed the Super Lynx.

## Variants

**HAS 2(FN):** French Navy anti-submarine warfare version, with DUMRA-Sigint OHF 3TVs radar and Alcatel banking sonar.

**HAS 2:** Original British Royal Navy version, with Ferranti Seaspray radar, Bendix dipping sonar and Reus Instruments MAD.

**HAS 3:** Improved British version with two Rolls-Royce Gem 41-1 kW (shp) engines.

**HAS 3(C):** Specialised British version for Arctic operations from HMS Endeavour.

**HAS 35:** Specialised British version with surveillance and secure communications equipment.

**HAS 3(M):** Improved British version for Gulf War with ALO-167 electronic counter-measures pod and infra-red jammers.

**HAS 3(CT):** Improved British version with central tactical



Westland Lynx Mk 21

(GKN Westland)

## Specifications (for HAS 2)

### Powerplant

Two Rolls-Royce Gem 2 turboshafts

Power: 1100 shp (1342 kW)

Payload: 2000 lb (907 kg)

### Performance

Cruising speed: 165 mph (265 kph)

Range: 340 nm (630 km)

### Dimensions

Length: 49 ft 5 in (15.2 m)

Rotor diameter: 47 ft (12.8 m)

Height: 11 ft 6 in (3.5 m)

### Armament

Mk 44, Mk 46 or Sting Ray anti-submarine outboarders. Mk 11 depth charges; Sea Skua radar-guided anti-ship missile; AS12 wire-guided missiles; 12.7 mm or 20 mm gun pods.

### Weights

Empty: 6000 lb (2720 kg)

Max T/O: 10 000 lb (4535 kg)

## Westland Lynx (Navy version) (UK)

systems and flotation bag.

HAS 4 (FN): Improved French Navy version with new Gem 41-1 engine, and gearbox.

Mk 21: Export version for Brazil, designated SAH-3T

Mk 21A: Lighter version of Super Lynx for Brazil.

Mk 33: Export version for Argentina (later sold to Brazil and Denmark)

Mk 25/UH-14A: Export utility version for Netherlands

Mk 27/SH-14B: Export version for Netherlands with radar

Mk 30: Export version for Denmark

Mk 31/SH-14C: Export version for Netherlands with M&D

Mk 36: Export version for Norway

Mk 37: Export version for Argentina.

Mk 38: Export version for Germany.

Mk 39: Export version for Algeria.

Mk 50: Export version for Denmark

HAS 8: Super Lynx upgraded version, with up-rated Rolls-Royce Gem 42-1 engines, BERP rotor blades, thermal imaging sensors and improved electronic warfare systems.



**Above:**  
**Westland Lynx HAS**  
**Mk 8/Super Lynx**  
(GKN Westland)



**Left:**  
**Westland Lynx**  
**HAS Mk 2 (FN)**  
(Torr Ripley)



Mk 95: Export Super Lynx for Portugal.  
Mk 99: Export Super Lynx for South Korea.  
SH-149: Export version for the Netherlands with upgraded Rolls  
Royce Gem 42-1 engines and full ASW kit.  
Super Lynx Series 2400/3000: Export version with 1000 ft  
CIS/100, improved winch and 'glass' cockpit.

## Status

In production.

## Operators

Iceland (navy), Denmark (navy), France (navy), Germany (navy),  
Malaysia (navy), Netherlands (navy), Nigeria (navy), Norway  
(navy), Pakistan (navy), Portugal (navy), South Korea (navy),  
UK (navy).

## Manufacturer

Westland Helicopters/GKN Westland (UK).

## Right:

**Westland Lynx HAS Mk 9/Super Lynx**  
(GKN Westland)



# Kaman Seasprite (USA)

Type: Shipborne anti-submarine helicopter

Accommodation: Two pilots, sonar operator, four passengers

## Development/History

Making its first flight in 1959, the SH-2F version of the Sea Sprite utility helicopter was selected in 1970 by the US Navy for work on frigates, destroyers and cruisers in the anti-submarine role, under the LAMPS I programme. It lost out to the SH-60 in the LAMPS II contest, and the bulk of the US Navy's fleet have been either relegated to reserve service or retired into storage. A programme to upgrade some surplus US versions to the anti-ship missile armed SH-2G standard is underway, and the improved helicopter has recently found export success in Australia and New Zealand.

## Variants

UH-2B: Shipborne utility helicopter for US Navy.

SH-2D: Initial winner of US Navy Light Airborne Multi-Purpose System (LAMPS) platform contest for embarked small ship helicopter. Powered by two T50-GR-8 Pratt & Whitney.

SH-2F: Improved version with 10% longer life rotor blades, new search radar and linked MAD boom.

SH-2G Super Seasprite: Advanced version powered by two General Electric T400 GE-401 turboshafts, each rated to 1215 kW (1720 shp). It has improved mission sensors and weapon carriage capabilities.

SH-2G(E): Specialist anti-submarine warfare upgrade for Egypt.

SH-2G(A): Australian export version.

SH-2G(M): Proposed version for Malaysia.

## Status

Work continues on SH-2G standard upgrades.



*Kaman SH-2F of HSL-34*

*(Jeremy Slack/APB)*

## Specifications (for SH-2G)

### Powerplant

Two General Electric T400-GE-401 turboshafts

Power: 2446 shp (2570 kW)

Payload: 4000 lb (1814 kg)

### Performance

Max speed: 150 mph (250 km/h)

Range: 428 nm (805 km) with external tanks

### Dimensions

Length: 30 ft 6 in (12.34 m)

Rotor diameter: 44 ft 4 in (13.5 m)

Height: 15 ft 7 in (4.6 m)

### Armament

Mk 46, 50 torpedoes, depth charges, 7.62 mm floor guns; Penguin Mk 2 Mod 7 radar-guided anti-ship missiles, AGM-183/MNZ Maverick air-to-surface guided missile

### Weights

Empty: 9200 lb (4173 kg)

Max T/O: 13 500 lb (6124 kg)

**Operators**

Argentina (navy), Australia  
Navy, Pakistan (navy), New  
Zealand (air force).

**Manufacturer**

Kaman Aerospace (US).



**Right:**  
**Kaman SH-2F of HSL-34**  
(Jeremy Flack/API)

# Bell Model 47 Sioux (USA)

Type: Light helicopter

Accommodation: Two pilots, one passenger

## Development/History

One of the first helicopters to go into large-scale production after making its first flight in 1945, some 5,000 have since been built. Although it has now been withdrawn from frontline service by most NATO users, it can still be found in use in obscure corners of Asia and South America.

## Variants

H-12 Sioux: Basic US Army and USAF version.

TH-12/THL-12/3/4/6/6P: US Navy trainer versions.

HH-12/12P: US Navy version for training and ice-breaking ship operations.

OH-12: Three-seat version.

UH-12: US Navy training version.

AB-47: Italian-built version.

AH-12/12-2: HK-built version, designated Sioux AH 12.

## Status

No longer in production.

## Operators

Colombia, Congo (Zaire), Greece (air force), Italy (army).

Lesotho, Libya (army), New Zealand, Pakistan (army).

Papua New Guinea, Peru (air force), South Korea (army), Uruguay (navy), Zambia.

## Manufacturer

Bell Aircraft Corporation/Bell Helicopter Company (USA), Agusta (Italy), Westland Helicopters (UK), Kawasaki Heavy Industries (Japan).



*Bell 47G operated by the British Army as the AH.1 Sioux*

(AP)

## Specifications (for Model 47G-3B-2A)

### Powerplant

One Lycoming TVO-435-F1A piston engine

Power: 200 hp (200 kW)

### Dimensions

Length: 31 ft 7 in (9.6 m)

Rotor diameter: 37 ft 4 in (11.3 m)

Height: 9 ft 3 in (2.8 m)

### Weights

Empty: 2000 lb (905 kg)

Max T/O: 2950 lb (1330 kg)

### Performance

Max speed: 105 mph (168 km/h)

Range: 215 nm (397 km)

# Bell Model 204/UH-1 Iroquois (Huey) (USA)

Type: Light utility helicopter

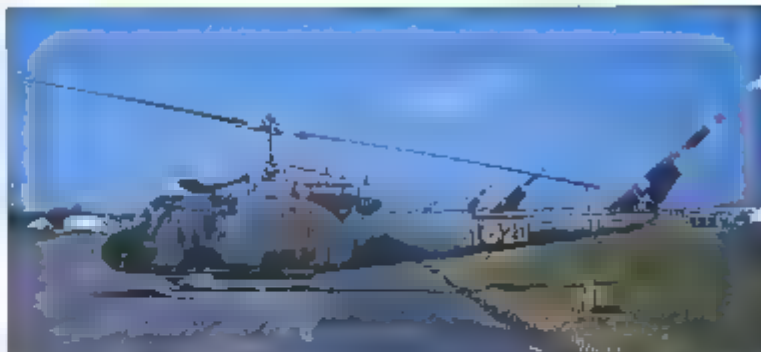
Accommodation: Two pilots, seven passengers

## Development/History

The first of the famous 'Huey' family of helicopters, which were the main of the US Army campaign in Vietnam. Several thousand built for the US armed forces from 1956 through to the late 1960s.

## Variants

**HU-1A:** Initial production version for US Army with Lycoming XT63-L-1 turboshaft, rated at 615 kW (825 shp). Capacity of six passengers. Source of 'Huey' nickname.  
**HH-1B:** Enhanced version with capacity for seven passengers and heated main rotor blades.  
**HH-1A:** Re-designated in 1962 as HU-1A.  
**UH-1B:** Re-designation in 1962 of HH-1B.  
**UH-1C:** Improved version of UH-1B, with TS3-L-13 powerplant.  
**UH-1E:** US Marine Corps version with hoist and twin 2.62 mm M19 gun turret.  
**TH-1E:** US Marine Corps dual control trainer.  
**UH-1F:** 115th Tiltrotor Mobile Air Support version with General Electric T63-GE-3, rated to 962 kW (1290 shp).  
**TH-1F:** Trainer version of TH-1E.  
**HH-1B:** US Navy rescue version with hoist and TS3-L-13 powerplant, rated to 1044 kW (1400 shp).  
**UH-1L:** US Navy utility version with TS3-L-13 powerplant.  
**TH-1L:** US Navy training version with TS3-L-13 powerplant.  
**UH-1M:** US Army version with night vision sensor fit.  
**AO 204:** Italian-built version, with powerplant options including TS3-GE-3, rated at 962 kW (1290 shp), Textron Lycoming TS3-L-11A or Rolls-Royce Litecure RT200, rated at



*Agusta Bell AH 204B*

*(Jeremy Flin/WAP)*

## Specifications (UH-1C)

### Powerplant

One Textron Lycoming TS3-L-17  
Power: 1100 shp (807 kW)

Max I/O: 9500 ft (4300 kg)

Payload: 1280 lb (3000 kg)

### Dimensions

Length: 42 ft 7 in (12.98 m)  
Rotor diameter: 44 ft (13.41 m)  
Height: 12 ft 7.25 in (3.84 m)

### Performance

Cruising speed: 140 mph (225 km/h)  
Range: 332 nm (615 km)

### Weights

Empty: 5070 lb (2300 kg)

### Armament

One machine gun, machine gun pods, free-flight rocket pods, M44 torpedoes

## Bell Model 204/UH-1 Iroquois (Huey) (USA)



512 kW (1250 shp).

**Hkp 3B:** Swedish designation of AB 204. AB 204AS: Italian-built naval version, with TS3-GF-3 powerplant rated at 662 kW (1290 shp).

**Fuji-Bell 204R-2:** Japanese land version, also known as Hiyuden.

**Huey Tur:** HH-47 with six-turbine engines.  
**HH-2:** Rescue version.

### Status

No longer in production.

### Operators

Austria, Colombia (air force), Honduras, Indonesia (army), Italy (army), Japan (army), Panama, Paraguay, Somalia, South Korea (army), Spain, Sweden (army), Thailand (army), Turkey (army), naval, Yemen.

### Manufacturer

Bell Aircraft Company/Bell Helicopter Company (USA), Agusta (Italy), Fuji-Bell (Japan).

**The Swedish army operates the AB 204 as the Hkp 3B**

*Jeremy Flack/APH*

# Bell Model 205/UH-1 Iroquois (Huey) (USA)

Type: Medium-lift helicopter

Accommodation: Two pilots, 12 passengers, six stretchers

## Development/History

The first major upgrade of the ever popular 'Huey', which featured a stretched and reinforced rotor hub to boost carrying capacity. The first of 2500 ordered for the US armed forces entered service in 1963, whilst the last H-model was produced as recently as 1986. It is set to continue in US military service until well into the next century.

## Variants

UH-1D: Original US Army version, with Lycoming T53-L-11 powerplant, rated to 225 kW (300 shp). Capable of carrying 12-14 passengers.

UH-1H: Upgraded version for US Army, powered with T53-L-13 powerplant.

UH-1V: US Army medical and rescue version with hoist.

CH-119: Canadian training version, designated CH-119.

CH-119: Electronic warfare 'Quick Ha' version.

UH-1H: USAF rescue version.

UH-1HP Huey II: Commercial upgraded version with improved powerplant.

Huey H00: Commercial upgraded version with H00E1 'Eco' powerplant.

UH-1/T100 Ultra Huey: Commercial upgraded version with General Electric T700-GE-701C powerplant, rated to 1400 kW (1900 shp).

UH-1H: Japanese-built version.

AB 206A: Italian-built military version, designated EM-2, with T53-L-13 powerplant.

AB 206A-1: Improved Italian 206A.

AB 206BG: Prototype Italian version with two (Prime II



*Bell UH-1D of German Luftwaffe*

*(Tim Ripley)*

## Specifications (for UH-1H)

### Powerplant

One Turbine Lycoming T53-L-13 turboshaft

Power: 1400 shp (1034 kW)

Max T/O: 2500 lb (1133 kg)

Payload: 2000 lb (907 kg)

### Dimensions

Length: 41 ft 9 in (12.6 m)

Rotor diameter: 40 ft (12.2 m)

Height: 14 ft 5 in (4.4 m)

### Performance

Max speed: 127 mph (204 km/h)

Range: 270 mi (510 km)

### Weights

Empty: 5200 lb (2363 kg)

### Armament

Two machine guns in door; optional rockets and anti-air gun pods.

## Bell Model 205/UH-1 Iroquois (Huey) (USA)



1200 powerplants.

Alt 206A: Prototype turboprop Astazou powerplants.

HE.10B: Spanish designation for AB 205

Advanced 205B: Proposed Japanese upgrade.

### Status

No longer in production.

### Operators

Argentina (army/navy/air force), Australia (army), Belgium,  
Bangladesh, Bolivia, Bosnia-Herzegovina (military air force), Brazil,  
Canada, Chile (army/air force), Colombia (air force), Croatia,  
Dominican Republic, Dubai, El Salvador, Germany (army/air force),

Greece (army/air force), Guatemala, Honduras, Indonesia (army), Iran  
(army navy air force), Italy (army), Israel, Japan (army),  
Jordan, Kuwait (air force), Malaysia, Myanmar, New Zealand (air  
force), Oman, Pakistan (army), Panama, Papua New Guinea, Peru (air  
force navy), Philippines, Saudi Arabia (air force), Singapore, South  
Korea (army/air force), Spain (army), Sudan, Taiwan (army/air  
force), Tanzania, Thailand (army/navy/air force), Tunisia, Turkey  
(army/air force), Uganda, UAE (UAE), USA (army/air force),  
Uruguay (air force), Venezuela (army/air force), Zambia, Zimbabwe.

### Manufacturer

Bell Helicopter Company/Bell Helicopters Division (USA), Augusta  
(Italy), AIDC (Taiwan), Dornier (Germany), Fuji-Bell (Japan)

**Bell UH-1H of  
US Army  
Reserve**  
(Tim Ripley)



# Bell Model 212 UH-1N Iroquois (Twin Huey) (USA)

Type: Medium-lift helicopter

Accommodation: Two pilots, 14 passengers

## Development/History

A twin-engine 'Huey' was first proposed by Bell Helicopters, Pratt & Whitney Canada and the Canadian Government in 1960. The USAF took delivery of the first aircraft in 1970, and it soon became the standard utility helicopter of the US Marine Corps. Foreign sales followed in large numbers, with more than 612 being built to date.

## Variants

UH-1N: Basic US Navy and Marine Corps version.

VH-1N: USAF and US Marine Corps VIP transport.

CH-136: Canadian version, later designated CH-138 Twin Huey.

Twelve-Twelve: Civil commercial version.

AB 212: Italian-built military version, with Pratt & Whitney Canada PT6T-7 turbo-twin four powerplant.

AB 212ASW: Italian maritime version (described elsewhere).

HU-1N: Spanish Army designation.

UH-1N (40N): Four-blade USMC upgraded version.

## Status

In production.

## Operators

Argentina (army/air force), Austria, Bahrain, Bangladesh, Bolivia, Brazil, Chile (air force), Dominican Republic, Ecuador (air force), El Salvador, Ghana, Greece (army/air force), Guatemala, Guyana, Iran (army/navy), Iran (air force), Italy (army/air force), Jamaica, Japan (army), Lebanon, Malia, Mexico (air force), Monaco, Oman, Panama, Peru (air force).



Bell UH-1N of the USAF

(USAF)

## Specifications (UH-1N)

### Powerplant

Two Pratt & Whitney Canada PT6T-3B turbo

twin four

Power: 1800 shp (1342 kW)

### Dimensions

Length: 47 ft 4 in (14.5 m)

Rotor diameter: 46 ft 2 in (14.2 m)

Height: 14 ft 10 in (4.53 m)

### Weights

Empty: 6097 lb (2765 kg)

Max. L/O: 11 200 lb (5080 kg)

Payload: 5000 lb (2268 kg)

### Performance

Max. speed: 117 mph (189 kph)

Range: 243 nm (450 km)

## Bell Model 212 UH-1N Iroquois (Twin Huey) (USA)



Philippines, Saudi Arabia (air force), Singapore, Slovenia,  
South Korea (air force), Spain (army/navy), Sri Lanka,  
Sri Lanka, Sudan, Thailand (air force/navy), Tunisia, Turkey  
(army), Uganda, Uruguay (air force), Venezuela (navy),  
Yemen, Zambia, UAE (Dubai), UK (army), USA (navy/marines),  
United Nations.

### Manufacturers

Bell Helicopter Company/Bell Helicopters Inc/Leon  
USA/Canada, Agusta (Italy)

***Bell UH-1N of the USMC  
(Tom Ripley)***



# Bell Model 412 (USA)

**Type:** Medium utility and transport helicopter

**Accommodation:** Two pilots, 14 passengers

## Development/History

The most recent version of the 'Huey' still manages to find customers around the world. A number of companies are also offering upgrade packages to basic versions.

### Variants

**412:** Basic production version

**412SP:** Special Performance version, with improved fuel capacity, known as Apache in Bergevin's service

**412HP:** Emergency medical services version, with improved transmission and Pallet-Belt Train Pac

**Military 412:** Armed version

**412EP:** Enhanced performance version with additional fuel. Designated Griffin III.1 in UK service

**CH-146 Griffon:** Canadian military version of 412SP

**NBell-412:** Indonesian-built version

**AB412 Griffon:** Italian-built military version. Designated: HH-4 in Italian service.

**AB412 CRESO:** Italian-built ground surveillance radar platform

**Hkp 11:** Swedish designation.

**AN 412 EP:** Argentine-built version.

### Status

In production.

### Operators

Bahrain, Belgium, Canada, Colombia (air force), Guatemala, Guyana, Iceland (coast guard), Honduras, Indonesia (army), Italy (army/navy/air force), Lesotho, Netherlands (air force),



**Bell 412**

(from Huey)

## Specifications (for 412HP)

### Powerplant

One Pratt & Whitney Canada PT6T-3B-1 Turbo

Prop Pac

Power: 1800 shp (1342 kW)

### Dimensions

Length: 42 ft 4 in (12.92 m)

Rotor diameter: 46 ft (14.02 m)

Height: 15 ft (4.57 m)

### Weights

Empty: 6054 lb (2746 kg)

Max T/O: 11 900 lb (5397 kg)

### Performance

Cruising speed: 140 mph (226 km/h)

Range: 402 mi (745 km)

### Armament

Door-mounted machine guns, minigun pods, rocket pods; Air-to-air and air-to-surface missiles

Norway, Peru (air force), Poland (air force), Saudi Arabia (air force), Slovenia, South Korea (air force), Sri Lanka, Sudan, Sweden (army), Thailand (air force/army), Uganda, UAE (Emiri), United Nations, UK (MoD), Zimbabwe

**Manufacturer**

Bell Helicopters Textron (USA/Canada), Agusta (Italy), OHV (Indonesia)



**Bell 412 of Dubai  
Police Air Wing**  
(Tim Ripley)

# Bell Model 206 JetRanger (USA)

Type: Light helicopter

Accommodation: Two pilots; three passengers

## Development/History

The best-selling JetRanger first flew in 1966, and three years later the US Army started to take delivery of the OH-6A variant (see separate entry). It has since been adopted by a large number of ground forces around the world. Some 2,000 had been built by 1995.

## Variants

Model 206A JetRanger: First production version, with Allison 250-C18 engine, rated to 235 kw (317 shp).

Model 206B JetRanger II: Second production version, with Allison 250-C20, rated to 245 kw (330 shp).

Model 206B-3 JetRanger II: Improved version with 250-C20B powerplant.

Model 206A-5: Chinook navy version, armed with magazines TH-67 Creek: US Army version of JetRanger II, adapted for basic flight training tasks (designation H-206).

Model 206L-1 LongRanger: Stretched fuselage version of JetRanger II.

Model 206L-2 LongRanger II: Improved L-1, with Allison 250-C20B turbo-shaft, rated to 265 kw (357 shp).

Model 206L-3 LongRanger III: Improved version with Allison 250-C30B turbo-shaft rated to 300 kw (405 shp).

Model 206L-4 LongRanger IV: Canadian-built version.

Model 206LT TwinRanger: Canadian-built four-engine version.

Model 206L TexasRanger: Proposed military version of L-2.

Canlon CB 206L-III: Proposed gunship version for Iraq, built in Chile.

TH-57A SeaRanger: US Navy training version to 206A.

90



Bell 206 in United Nations service in Croatia

(Tim Ripley)

## Specifications (206B-3 JetRanger III)

### Powerplant

One Allison 250-C20B turbo-shaft

Power: 320 shp (233 kW)

### Weights

Empty: 1,625 lb (737 kg)

Max. 3/0: 3,900 lb (1,765 kg)

Payload: Under-slung 1,500 lb (680 kg)

### Dimensions

Length: 31 ft 2 in (9.5 m)

Rotor diameter: 33 ft 4 in (10.2 m)

Height: 9 ft 6 in (2.9 m)

### Performance

Max. speed: 140 mph (225 km/h)

Range: 325 nm (602 km)

### Armament

Door guns; magazines



standard.

**TH-57B SeaRanger:** US Navy training version for 206B

standard

**TH-57C SeaRanger:** US Navy training version for Jet Ranger III standard.

**AB 206A-1:** Italian-produced military version for 206A standard, designated LRI-2 by Italian military.

**AB206A-2:** Italian-produced military version for 206B standard, designated LRI-2 by Italian military.

**AB206C-1:** Italian-modified A-1s upgraded to A-2 standards with U20 engines.

**Hkp 6A:** Swedish designation of Italian-produced 206A.

**JIR 12A:** Spanish designation of AB 206A-1

**Zafar 300:** Iranian-produced version of 206B-1.

## Status

In production

## Operators

Austria, Bangladesh, Brazil (navy), Canada, Cameroon, China (army/navy), Columbia (air force), Cyprus, Croatia, Ecuadorian (navy), Greece (army/navy), Guatemala, Guyana, Honduras, Israel, Iran (army/navy), Italy (army), Libya (army), Malta, Mexico (air force), Monaco, Oman, Pakistan (army), Peru (army/navy/air force), Saudi Arabia (air force), Slovakia, South Korea (navy), Sri Lanka, Sweden (army/navy), Tanzania, Taiwan (air force), Thailand (army), Turkey (army), Uganda, UAE (Dubai), USA (army/navy), United Nations, Venezuela (army/coastal guard), Yemen.

## Bell 206L-4 LongRanger 4 (Bell Helicopters)

## Manufacturer

Bell Helicopter Company/Bell Helicopters Textron (USA/Canada), Agusta (Italy), Eurocopter Industries (Chile)

# Bell Model 206/OH-58 Kiowa (USA)

Type: Light observation and utility helicopter

Accommodation: Pilot, co-pilot side-by-side, three passengers

## Development/History

The US Army bought some 2000 versions of the OH-58 Kiowa from 1969 onwards to fly scout missions with specialist equipment fitted. The basic design has since undergone a number of upgrades to enhance its battlefield survivability.

## Variants

OH-60A: Original US Army scout version

OH-60H: Export version for Austrian Army

OH-60C: Upgraded US Army version with dual glass canopy and Allison T63-A220 turboshafts, rated to 333 kW (450 shp)

COH-58A: Canadian version to OH-58A standard, later redesignated CH-119 Kiowa.

Model 206B-1 Kiowa: Australian produced version, later renamed Kulkabini

## Status

No longer in production.

## Operators

Austria, Australia (army/navy), Canada, USA (army)

## Manufacturer

Bell Helicopter Company/Bell Helicopters Textron (USA), Commonwealth Aircraft Company (Australia)



US Army OH-58A Kiowa

*Jeremy Hackett/AFW*

## Specifications (for OH-58A)

### Powerplant

One Allison T63-A-200 turboshaft

Power: 317 shp (236.5 kW)

### Weights

Empty: 1182 lb (533 kg)

Max T/O: 3000 lb (1361 kg)

### Dimensions

Length: 32 ft 2.5 in (9.84 m)

Rotor diameter: 35 ft 4 in (10.77 m)

Height: 9 ft 6.5 in (2.91 m)

### Performance

Cruising speed: 122 mph (196 km/h)

Range: 260 mi (401 km)



# Bell Model 406/OH-58D Kiowa Warrior (USA)

Type: Light armed reconnaissance helicopter

Accommodation: Two pilots side-by-side

## Development/History

The 'ultimate' version of the OH-58, the Kiowa Warrior boasts an air-to-surface weapons variant to allow it to operate alongside the AH-64 Apache as part of joint air attack teams. The Army Helicopter Improvement Program (AHIP) began in 1981, and the first helicopters entered service in 1984.

## Variants

OH-58D Kiowa Warrior: US Army armed Scout version  
MH-58P/Purple Eagle Helicopter: US Army medical support including hoisting rotor blades and can be also transport on C-130 transport aircraft

Prime Change: Circle name for first aircraft fitted with Hellfire and Stinger missiles for supporting exact strikes in Middle East in 1992.

MH-58D/406C Combat Scout - Scout 1 and Scout 2 version  
Also features provision for OH-20 mini cannon but no anti-aircraft sight,  
OH-58K: Stealth technology demonstrator.

## Status

In production,

## Operators

Saudi Arabia (Army), Taiwan (Army), USA (Army)

## Manufacturer

Bell Helicopters Textron (USA),



*Bell OH-58D Kiowa Warrior*

*(Bob Helicopter Textron)*

## Specifications

### Powerplant

One Allison T701-AD-700 Turboshaft

Power: 650 shp (485 kW)

Max T/A: 3,400 lb (1,540 kg)

Weighted: 2,000 lb (907 kg)

### Dimensions

Length: 34 ft 4 in (10.5 m)

Rotor diameter: 35 ft (10.7 m)

Height: 17 ft 10 in (5.9 m)

### Performance

Max speed: 147 mph (237 km/h)

Range: 250 nm (463 km)

### Armament

Stores air-to-air missiles; AGM-114 Hellfire laser-guided anti-tank missiles; machine gun pods, free-flight rocket pods

# Bell Model 209/AH-1F/G Huey Cobra (USA)

Type: Attack helicopter

Accommodation: Pilot, gunner in tandem cockpit

## Development/History

Bell Helicopters first produced a gunship version of the Huey in 1965 as a private venture. Its distinctive tandem seating and nose turret have since been copied by attack helicopter designers around the world. Some 1000 G-models were bought by the US Army and it proved very effective when used in action during the later years of the Vietnam war. The need to counter masked Soviet armoured formations during the Cold War led to a series of upgrading programmes to provide the Cobra with the capacity to fire IRBMs, water-gulphed anti-tank missiles. Sensor upgrades improved the performance at night and in bad weather. Israeli, Iranian and Turkish forces have used IRBM armed Cobras in combat in the Middle East. US Army late-model Cobras were used in the 1991 Gulf War, and in conflicts in Somalia, Haiti and Bosnia.

## Variants

Model 209: Original prototype.

AH-1G: Original US Army gunship version, with T53-L-13 turbo-shaft, rated to 1044 kW (1400 shp).

T11-10: Dual control trainer version.

AH-1E: Enhanced Cobra armament version with TOW missiles.

AH-1F: TOW missile armed version.

AH-1Q: Shipboard version to allow TOW missile carriage.

AH-1R: Upgraded version with T53-L-703 powerplant.

Improved AH-1S: US Army combat-upgraded standard for its G/GO models, with T53-L-703 powerplant.

Production AH-1S: New-build versions to AH-1S standard.

Up-gunned version has 20 mm cannon nose turret.



US Army AH-1G

(Jeremy Flack/AP)

## Specifications (for AH-1F)

### Powerplant

One Lycoming Lycoming T53-L-703 turbo-shaft.

Power: 1620 shp (1242 kW)

### Dimensions

Length: 53 ft 3 in (16.18 m)

Rotor diameter: 44 ft (13.41 m)

Height: 13 ft 5 in (4.09 m)

### Weights

Empty: 6528 lb (2963 kg)

Max 1/13: 9100 lb (4130 kg)

### Performance

Cruising speed: 141 mph (227 km/h)

Range: 274 nm (507 km)

### Armament

Four hard points, eight TOW water-gulphed anti-tank missiles, four 4.75 in rockets, M27 20 mm cannon in nose turret, 30 mm grenade launcher in tail turret.

**AH-1F:** Re-designation and upgrade of US Army SF/PY model Cobras, features flat cockpit glass, nose fold, night and T-301-100 powerplant. Current, intensive version. Advanced AH-1F/Model 300 **King Cobra:** Experimental version with single Cyclonney T-55-L-7C powerplant.

### **Status**

Not under production

### **Operators**

Bahrein, Israel, Japan (Army), Jordan, Pakistan (Army), South Korea (Army), Thailand (Army), Turkey (Army), United Nations

### **Manufacturer**

Bell Helicopter Company/Bell Helicopters (France) (USA), Top-Bell (Japan).

### **Right:**

**AH-1G Huey Cobra of the Maryland National Guard**

(Jeremy Flack/AP)



# Bell Model 209/AH-1W Super Cobra (USA)

Type: Attack helicopter

Accommodation: Pilot, co-pilot/gunner in tandem

## Development/History

US Marine Corps requirements for a twin-engined gunship to allow safe over-sea operations led to the fielding of the AH-1J from 1971 onwards. Iraq ordered an improved version but this was abandoned after the fall of the Shah in 1979. The US Marine Corps took over the programme which led to the 'Winky' version. It saw action during the 1991 Gulf War, claiming hundreds of kills on Iraqi tanks with its laser-guided Hellfire missiles.

## Variants

**AH-1J Sea Cobra:** US Marine Corps version with two Pratt & Whitney Canada T400-CP-400 turboshafts, rated at 1,042 kW (1400 shp) each.

**AH-1J Improved (light):** Export version of AH-1J.

**AH-1T Improved Sea Cobra:** Upgraded AH-1J for US Marines with improved T400-CP-402 powerplants, each rated at 1,469 kW (1970 shp).

**AH-1W Super Cobra:** Basic US Marine Corps version with improved T700-GE-401 powerplants, each rated at 1,786 kW (2371 shp).

**Cobra Venom:** Proposed UK version.

**AH-1W (AHWW):** Proposed upgrade for US Marine Corps, providing four main rotor blades and weapon system improvements.

**AH-1R0:** Romanian-produced version, with customised weapon system.

**Model 309 King Cobra:** Experimental upgrade with two engines and improved weapons system.

**Model 249:** Experimental four-blade version.



*Bell AH-1W Cobra*

*(Bell Helicopter Textron)*

## Specifications (AH-1W)

### Powerplant

Two General Electric T700-GE-401 turboshafts

Power: 3446 shp (2370 kW)

Wtload: 4552 lb (2065 kg)

### Performance

Max speed: 174 mph (270 km/h)

Range: 365 nm (587 km)

### Dimensions

Length: 45 ft 6 in (13.9 m)

Rotor diameter: 43 ft (14.6 m)

Height: 10 ft 6 in (3.1 m)

### Armament

One three-barrel M197 20 mm gun in nose turret; four hard points; 10W wire-guided anti-tank missiles; Hellfire laser-guided anti-tank missiles; AIM-9L Sidewinder air-to-air missiles; gun pods, cluster bombs; AC-119G rocket pods

### Weights

Empty: 200 lb (4627 kg)

Max T/O: 10 750 lb (6630 kg)

**Status**

In production.

**Operators**

USA (marines), Thailand  
(army), Turkey (army)

**Manufacturer**

Bell Helicopter Company/Bell  
Helicopters Textron [USA], IAR  
SA Bucuresti (Romania)

**Bell AH-1W Cobra**  
(Bell Helicopter Textron)



# Bell/Boeing V-22 Osprey (USA)

Type: Tilt-rotor transport

Accommodation: Two pilots, crew chief, 24 troops

## Development/History

This revolutionary aircraft has gone through a prolonged development phase but has now progressed to production with the first examples being delivered in 1999. The Osprey uses its rotors to take off vertically, and they then rotate to provide the power for horizontal flight. Current plans call for some 452 to be produced by the US Marines to replace their CH-46 assault helicopters. The first unit, HMV-204 'The White Knights', is scheduled to become operational at MCRD Parris, North Carolina, by 2001. The USAF has a requirement for 60 Ospreys for special operations missions to be in service by 2009. The US Navy wants 60 Ospreys for combat search and rescue, low rate initial production began in 1997 at two aircraft a year, rising to eight in 2000 with a decision on full production for that same year.

## Variants

V-22 EMB: Engineering and manufacturing development aircraft

MV-22B: US Marine Corps assault production version

SV-22A: Proposed initial US Navy anti-submarine warfare version.

CV-22B: USAF special operations production version.

HV-22B: US Navy combat search and rescue production version.

Bell-Boeing 600: Civilian passenger/VIP transport tilt rotor, built to a smaller scale.

## Status

In production.



*Bell Boeing V-22 Osprey*

*(Bell Boeing)*

## Specifications (V-22B)

### Powerplant

Eng: Allison 1406-AD-410 turbofans

Power: 12 340 shp (2172 kW)

Payload: 20 000 lb (9072 kg)

### Performance

Max speed: 115 mph (185 km/h) in helicopter mode; 316 mph (509 km/h) in fixed wing mode  
Range: 1200 nm (2224 km)

### Armament

Door-mounted machine guns; maritime versions may be adapted to carry torpedoes and depth charges

### Dimensions

Length: 57 ft 4 in (17.5 m)

Rotor diameter: 30 ft (9.1 m) each

Height: 17 ft 4 in (5.28 m)

### Weights

Empty: 31 886 lb (14 463 kg)

Max T/O: 55 000 lb (24 947 kg)

**Operators**

US (navy/marines/air force).

**Manufacturer**

Bell Helicopters Textron and  
Boeing Helicopters (USA)



**Bell Boeing V-22 Osprey**  
(Bell Boeing)

# Boeing CH-47 Chinook (USA)

Type: Heavy-lift helicopter

Accommodation: Two pilots, crew chief, 55 troops, 24 stretchers

## Development/History

The 'mighty' Chinook first flew in 1961 to fulfill a US Army requirement for a heavy lift helicopter. Viewed by the US Army as a 'flying truck', it proved its worth in Vietnam supplying air mobile troops, and flying supplies and artillery pieces to remote jungle fire bases. The large under-slung load capacity of the Chinook soon led it to being nicknamed 'Hubs' by US troops. Some 354 A-models were built for use during the Vietnam War, and more orders soon followed. A constant upgrade programme has significantly improved the capability of the US Army's Chinooks over the ensuing decades. Just under 600 were in service with the US Army, US Army Reserve and National Guard in 1997.

During the 1991 Gulf War CH-47s played a key role bringing the air mobile forces of the 101st Airborne Division deep behind Iraqi lines. They also opened the way for US police keeping safe to enter Kuwait in 1996 by lifting platform bridge sections into position across the Sabra River. Foreign customers have also found the Chinook much to their liking, and sales have been brisk both from its main plant in Philadelphia and other overseas production bases. Italy, Japan and the United Kingdom have been the largest customers for the Chinook. The latter using its aircraft extensively in the Falklands, Northern Ireland, the 1991 Gulf War and Bosnia. Iran found them invaluable during the 1980-88 war against Iraq, whilst Italy operated its helicopters heavily in Somalia in 1993, and then during the evacuation of its citizens from Albania during the 1997 civil war.

Following Britain's example of using the Chinook to move



Boeing CH-47D

(Trent Ripley)

## Specifications (for CH-47D)

### Powerplant

Two General Electric T55-E-712 turboshafts  
Power: 6000 shp (4474 kW)

### Dimensions

Length: 51 ft (15.5 m)  
Rotor diameter: 62 ft (18.3 m) each  
Height: 12 ft 11 in (3.8 m)

### Weights

Empty: 26 915 lb (12 200 kg)  
Max ft/c: 54 000 lb (24 494 kg)  
Payload: 27 062 lb (12 284 kg)

### Performance

Max speed: 177 mph (285 km/h)  
Range: 613 nm (1136 km)

### Armament

Door machine guns



As an aerially brigade, the Netherlands has ordered Chinooks to provide mobility for its new rapid reaction force. The US Army use their Chinooks for special forces operations, with night vision devices and in-flight refuelling equipment fitted to allow low-level penetration behind enemy lines at night. Britain's Royal Air Force is also procuring a version with similar capability for long range combat search and rescue missions.

Boeing's Chinook won the battle for its national orders against Sikorsky's Sea Stallion, with more than 1000 built, as ordered for the US Army and exported by 1997.

## Variants

CH-47A: Original US Army version, with T55-L5 powerplants, rated to 1141 kW (1550 shp).

CH-47B: Upgraded US Army version with T55-7C turboshafts, rated to 2125 kW (2850 shp) and new exit rotor diameter.

CH-47C: Further improved US Army version with T55-L11A turboshafts, rated to 2290 kW (3100 shp), and extra fuel capacity.

CH-47D: US Army version with T55-L12 turboshafts for better performance and triple-hook for improved handling of under-slung loads.

CH-147: Canadian version to CH-47C standard.

HC-147: Spanish version to CH-47C standard.

Chinook HC 1: British version to CH-47C standard, but with triple-hook capacity.

Chinook HC 1A: British version retrofitted with glass fibre blades.

Chinook HC 2: British version to CH-47D standard.



**Boeing CH-47D**

(Tom Ripley)

## Boeing CH-47 Chinook (USA)

**Chinook HC 2:** British version to MH-47E standard.  
**MH-47D:** Special Operations aircraft: Intends upgrade for US Army special operations and holding of MH-47E.  
**MH-47E:** Special forces version with in-flight refuelling, night flying capability and F56-L-712-58 engines, each rated to 3264 kW (4370 shp).  
**Model 414:** Export model to CH-47C standard.  
**International Chinook:** Export model to CH-47D standard.  
**CH-47C Plus:** Indian-built version with 165 L-432E powerplants and composite blades.  
**CH-47I:** Japanese-built version to CH-47D standard.  
**BV214MLR:** Swedish version.  
**CH-47D:** Proposed Cargo helicopter upgrade for US Army, possibly to be designated CH-46F.  
**Advanced Chinook:** Proposed version with 3800 shp (2779 kW) class engines, redesigned rotors and additional fuel.

### Status

In production.

### Operators

Argentina (air force), Australia (army), Egypt, Greece (army), Iran (army/air force), Italy (army), Japan (army/air force), Morocco, Netherlands, Singapore, South Korea (army), Spain (army), Taiwan, Thailand (army), UK (air force), USA (army).

### Manufacturer

Vertol Aircraft Corporation/Boeing Vertol/Boeing Helicopters (USA), Kawasaki Heavy Industries (Japan), Elisberti Meridionali/Agusta (Italy).



**Boeing CH-47 HC Mk 2**

(Tim Ripley)



**Boeing CH-47 HC.Mk 2**

(Tim Ripley)

# Boeing 107/CH-46 Sea Knight (USA)

Type: Medium-lift helicopter

Accommodations: Two pilots, crew chief, 25 troops

## Development/History

The certified main-bladed Vertol Model 107 made its first flight in 1960 and entered service with the US Marine Corps in 1964. Nicknamed the frog, it saw extensive service as an assault helicopter during the Vietnam War. Subsequent operators in Guatemala, the Persian Gulf, Somalia, Liberia and Haiti have seen the CH-46 in the centre of the action. An upgrade programme kept the aircraft flying through the 1970s, 80s and 90s as the mainstay of the Marine Corps' essential helicopter fleet. The Pentagon is keen to replace the ageing, and increasingly costly, CH-46 with the Osprey tilt rotor. Helicopters in the V-22 programme mean the 'Frog' will have to soldier on into the 21st century.

US Navy fleet support squadrons are huge users of the CH-46, operating from shore bases to supply ships. Foreign exports have been small, with Japanese production lines being the main centre of activity. One of the more famous exploits of the aircraft was to save the Soviet Navy's last Soviet submarines in the Baltic Sea during the 1990s.

## Variants

**107 Model 11:** Civilian version.

**HHB-1/CH-46A:** Original US Marine Corps assault version with two T50-GE-2B powerplants, each rated 15,232 kW (12,100 shp).

**UH-46A:** US Navy utility and cargo transport version.

**CH-46B:** Upgraded US Marine Corps version with T50-GE-10 turboshafts.

**UH-46D:** Upgraded US Navy version with T50-GE-10 turboshafts.

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Boeing CH-46E Sea Knight

(Tim Ripley)

## Specifications (for CH-46E)

### Powerplant

Two General Electric T50-GE-1G turboshafts

Power: 15,000 shp (7,788 kW)

Max 1/0: 73,000 lb (10,433 kg)

Payload: 9,000 lb (4,082 kg)

### Dimensions

Length: 44 ft 10 in (13.7 m)

Rotor diameter: 51 ft (15.5 m) each

Height: 16 ft 8 in (5.1 m)

### Performance

Max speed: 152 mph (235 km/h)

Range: 206 mi (330 km)

### Armaments

Dest machine guns

### Weights

Empty: 13,067 lb (5,927 kg)



UH-46D: US Marine Corps test version.

CH-46E: final production version for US Marine Corps, with improved avionics.

CH-46F: Hupahle U- and F-models for US Marine Corps. Includes glass fibre rotor blades, improved avionics and UH-46E powerplants.

UH-46F: VIP version for US Marine Corps.

KV-107 II/IIA: Japanese-built utility version, exported to South Africa.

HKp 4: Swedish designation for KV-107.

CH-113 Luliradlits: Canadian search and rescue version.

CH-113A Voyageur: Canadian army version.

### Status

Still in production

### Operators

Canada, Japan (Imperial Japanese Army), Sweden (Army), South Africa (Air Force), USA (many branches).

### Manufacturer

Boeing Aircraft Corporation/Boeing Vertol/Boeing Helicopters (USA), Kawasaki Heavy Industries (Japan).

### Boeing UH-46D Sea Knight

(Tim Ripley)

# Boeing/Sikorsky RAH-66 Comanche (USA)

Type: Reconnaissance/attack helicopter

Accommodation: Two pilots in tandem

## Development/History

The US Army's much troubled scout helicopter replacement programme has received significant funding, but as yet no decision is still uncertain. Boeing and Sikorsky won the HIX contract to replace the Cobra, OH-6 and OH-59 in 1993. Their first prototype flying in 1996. They have been contracted to supply six aircraft for testing to the US Army by 2002 under a \$1.699 billion contract. The second aircraft is to fly in 1998.

The Comanche has a number of unique features, including a stealthy fuselage and shrouded tail rotor. It is the first helicopter to be developed using stealth technology to minimise its radar cross section, heat signature and engine noise.

## Variants

Nil

## Status

In pre-production.

## Operators

US Army.

## Manufacturer

Boeing Helicopters and Sikorsky Aircraft (USA)



Boeing/Sikorsky RAH-66 Comanche

(Boeing Sikorsky)

## Specifications (for RAH-66)

### Powerplant

Two GEHC T800/GE-401 turboshafts

Power: 2680 shp (2000 kW)

### Dimensions

Length: 43 ft 4 in (13.2 m)

Rotor diameter: 39 ft (11.9 m)

Height: 11 ft 6 in (3.4 m)

### Weights

Empty: 7740 lb (3515 kg)

Max lift: 11 112 lb (5042 kg)

Wardload: 2617 lb (1185 kg)

### Performance

Max speed: 204 mph (328 km/h)

Range: 1260 nm (2344 km) with external tanks

### Armament

Under development



*Boeing/Sikorsky RAH-66 Comanche*

*(Boeing Sikorsky)*

# Boeing OH-6 Cayuse/MD500/MD530 (USA)

Type: Light utility helicopter

Accommodation: One or two pilots, four passengers

## Development/History

The OH-6 Cayuse was developed by the Hughes Helicopter Inc for the US Army's Light Observation Helicopter (LOH) requirement in the early 1980s. It was nicknamed the 'Loach'. It saw active service in Vietnam in large numbers. Hughes, and later McDonnell Douglas, have continued to develop and upgrade the basic design, with more than 6500 having being built by 1997.

## Variants

Model 200/300\* (larger derivatives of 500 series, which lacks enclosed rear fuselage). Military versions designated HH-60. Schweizer Aircraft have since developed the design.

OH-6A (Model 300M) Cayuse: Original US Army light observation helicopter, known as the Loach.

OH-6B: He engine'd version with 163.5-A-220 powerplant rated to 41.032 kW (55.20 shp).

OH-6C: Proposed five-bladed version with improved Allison 250-220 engine, rated at 298 kW (400 shp). Competition derivatives designated Model 500B and C.

OH-6D: Japanese-built version for OH-6A standard.

MH-6B: Special Forces version.

MH-6C: Special Forces version.

EH-6B: Special forces command post/electronic warfare version.

AH-6C: Special forces attack version.

Hughes 500X: Civil version of the OH-6A/Model 300 with Allison 250-C18A turboshaft, rated to 236.5 kW (321 shp). Model 600C: Export version modified for 'hot-and-high' operation.



Boeing MD500 in Israeli service

(H. Spokornik)

## Specifications (for Model 500E)

### Powerplant

One Allison 250-C20B turboshaft

Power: 450 shp (335.6 kW)

### Dimensions

Length: 23.0 (7.01 m)

Rotor diameter: 26 ft 5 in (8.06 m)

Height: 8 ft 6 in (2.62 m)

### Weights

Empty: 1445 lb (655 kg)

Max T/O: 3000 lb (1361 kg)

Payload: (530E) 2000 lb (907 kg)

### Performance

Max speed: 152 mph (242 km/h)

Range: 233 nm (431 km)

### Armament

10W wire-guided anti-tank missiles; Stinger air-to-air missiles; 30 mm cannon pod; 2.75 mm machine gun pod; four light rocket pods; 40 mm grenade launcher; Mk 44 or 46 torpedoes





**Model 600M Defender:** Commercial version of OH-6A.  
**TH-60A** light-built version based on up-engined Hughes 600, five-bladed main rotor and T-tail.  
**NINGONM:** Italian-built version based on up-engined Hughes 600.  
**Model 500M/ASW:** Export version for Spain with MAD Buini.  
**Model 500MD Defender:** Military version with armour and infra-red exhaust suppression.  
**Model 500D Scout Defender:** Armed reconnaissance version.

**Model 500AHAW Defender:** Maritime version with search radar and VAD boom.  
**Model 500AHQAW Defender:** Anti-tank missile armed version.  
**Model 500AH/MPWS - HW Defender:** Anti-tank missile version with mast-mounted sight.  
**Model 500MD Scout Advanced Scout Defender:** Four-bladed version with noise suppression.  
**Model 500MD Defender II:** Armed version with quiet slow turning four-bladed rotor.

**An OH-6 of the Danish army (AP)**

## Boeing OH-6 Cayuse/MD500/MD530 (USA)

**Model 500E:** Revised version with painted nose, improved tailplane and Allison 25-C700 powerplant.

**MM-500H:** High-altitude version of 500E.

**Model 500MQ Defender:** Specialist military version of Model 500E.

**Model 520MK Black Tiger:** Korean-built military version.

**MD600H Lifter:** Five-bladed main rotor fitted with painted nose, powered by Allison 250-C19 turboshaft, rated to 317 kW (425 shp).

**EH-6E:** Special forces command post/electronic warfare version with Allison 250-C19 powerplant.

**MH-6E:** Special forces version with Allison 250-C19 powerplant.

**AH-6F:** Special forces attack version Allison 250-C30 powerplant.

**MD530MQ Defender:** Military version with Allison 250-C30 powerplant.

**MD630 Nightfox:** Night attack version with improved sensors and powerplant.

**MD530MQ Paramilitary Defender:** Specialist version powerplant for police and border patrol.

**MD630H Lifter/AH-6H:** Special forces version to MD530MH standard, with glass cockpit and 'purple paint'.

**AH-6H:** Special forces attack version to MD530 standard.

**MH-6H:** Special forces version with improvements to MH-6H.

**AH-6H:** Special forces attack similar to MH-6H standard.



**MD530H on test at Mesa, Arizona (APR)**

## Status

In production.

## Operators

Q11-0

Brazil (air force), Egypt (army), Taiwan (air force).

## Notes

Anguilla (army/air force), Bolivia (air force), Colombia (air force), Costa Rica, Croatia, Cyprus, Denmark (army), El Salvador, Guatemala (air force), Honduras (air force), Israel, Italy (air force), Kenya, Mauritania, Mexico (air force), North Korea, South Korea (army/air force), Taiwan (army).

## Military

Chile (army), Colombia, Mexico (air force).

## Manufacturers

Hughes Tool Company/Hughes Helicopter Inc/McDonnell Douglas Helicopter Company/Boeing Helicopters (USA), Ilieda North/Augusta (Italy), Kawasaki Heavy Industries (Japan), Korean Air (South Korea), RACA (Argentina).



**OH-6A Cayuse**

(API)

# Boeing MD 520N/Explorer (USA)

Type: Light utility helicopter

Accommodation: One or two pilots, six passengers

## Development/History

The NOTAR is a revolutionary tail-rotorless helicopter concept, which has been under development since 1981. As yet it has not been officially adopted by a military user, although US Army special forces are understood to have used NOTAR versions.

## Variants

**OH-11A NOTAR:** Experimental version, first ever NOTAR helicopter.

**MD520N:** Experimental version with NOTAR tailless tail, five-bladed main rotor and Allison 250-C20B 2 turbo-shaft, rated to 235.7 kW (320 shp).

**MD Explorer:** Twin-engine NOTAR version. Military version called Combat Explorer.

**MD600N:** Wide-body single-engine NOTAR version. Previously designated MD600.

**MD900:** Eight-seat version of Explorer.

**MH-60/HH-60:** Suspected US special forces NOTAR versions.

## Status

In production.

## Operators

Nil.

## Manufacturer

Hughes Helicopter Inc/McDonnell Douglas Helicopter Company/Boeing Helicopters (USA).

*The revolutionary Boeing Combat Explorer is reported to be in service with the US Army Special Forces. (Boeing)*

## Specifications (for MD Explorer)

### Powerplant

Two Pratt & Whitney Canada PW 200B turbo-shafts

Power: 1250 shp (920 kW)

Max 1/D: 2000 lb (907 kg)

Payload: Under slung 2500 lb (1133 kg)

### Dimensions

Length: 32 ft 4 in (9.86 m)

Rotor diameter: 38 ft 10 in (11.84 m)

Height: 12 ft (3.66 m)

### Performance

Max speed: 112 mph (177 km/h)

Range: 374 nm (692 km)

### Armament

AGM-114 Hellfire laser-guided anti-tank missiles; machine gun pods; free-flight rocket pods

### Weights

Empty: 2215 lb (1008 kg)



# Boeing AH-64 Apache (USA)

Type: Attack helicopter

Accommodation: Pilot (rear), co-pilot/gunner (front)

## Development/History

After the successful combat debut of the Cobra in Vietnam the US Army began formulating requirements in the early 1970s for advanced attack helicopters. Bell Helicopters and Hughes Helicopter Inc were selected to develop competing designs and the latter company was declared the winning contender in 1976, although it was not until 1982 that the contract was won for the first batch of heavily-armed and armoured AH-64A Apaches. Hughes was bought by McDonnell Douglas in 1984, and its first Apache was being delivered. Since then the US Army has received some 1171 A-models, and more than 100 have been sold to export customers.

The AH-64A showed its potential during NATO helicopter exercises during the late 1980s, but it was not until the 1989 US operation to seize Panama that the Apache first saw action.

In the 1991 Gulf War the Apache showed its full potential by flying deep strike missions behind Iraqi lines. A US Army task force used Apaches to fire the first missiles of Operation Desert Storm, destroying a key Iraqi radar site. Supporting the Coalition ground assault, Apache helicopters accounted for more than 500 Iraqi tanks, 170 APCs, 30 air defence systems, 120 artillery pieces, 325 other vehicles, 10 radars, 50 trucks, 10 helicopters and 10 aircraft on the ground. Eight AH-64s were hit by enemy fire, but only one was shot down, with its crew surviving. Both forces have used the Apache extensively against Islamic guerrillas in southern Lebanon, and in a number of operations they have employed Hellfire missiles to 'surgically' assassinate key enemy commanders.



Boeing AH-64A Apache of Royal Netherlands Air Force

(Dagwing)

## Specifications (for AH-64A)

### Powerplant

Two General Electric T700-GE-700 turboshafts

Power: 3292 shp (2530 kW)

Wartime: n/a

### Performance

Max speed: 227 mph (365 km/h)

Range: 240 nm (437 km)

### Dimensions

Length: 51 ft (15.5 m)

Rotor diameter: 48 ft (14.6 m)

Height: 12 ft 7 in (3.8 m)

### Armament

One 30 mm M230 Chain Gun; AIM-114 Hellfire laser and infrared radar guided anti-tank missiles; Mistral, Stinger or Starstreak/Hellstreak air-to-air missiles, bee-flight rockets

### Weights

Empty: 11 225 lb (5095 kg)

Max T/O: 21 000 lb (9625 kg)



**Boeing AH-64A Apache**  
(Boeing)

## Boeing AH-64 Apache (USA)

The intimidating presence of low-flying Apache helicopters in Bosnia from 1998 onwards was considered by US Army commanders to be instrumental in the success of their peacekeeping mission.

The US Army is upgrading its Apache fleet by introducing the longbow millimetre radar and new radio frequency guided version of the Hellfire missile, which effectively allows for very long range engagements to be fought at night and in bad weather. All the US Army fleet will be modified to allow use of the most advanced longbow radar, but only some 227 radar sets are being purchased. The Netherlands and Britain are the first export customers for the longbow Apache. In preparation for deployment of the highly capable AH-64D, the Dutch have already received a number of US Army A models for use whilst new build machines are ready. Britain is setting up its own production line to produce its VBAH 64D, which will feature composite engines, weapon systems and defensive aids – the first helicopter is due to make its premier flight in March 1998.

### Variants

YAH-64/Hughes Model 77: Experimental version

AH-64A: Basic US Army version.

AH-64B/C: Proposed PAH version for German army

AH-64E: Longbow: Improved millimetre radar equipped version.

WAH-64E: UK first Longbow version with Rolls

Royce/Turbomeca RTM322 engines

AH-64C: US Army versions upgraded to allow installation of Longbow radar. Now to be designated D-models



**Boeing AH-64D Longbow Apache**

(Boeing)



**Petrol (Colours):** Israeli orange.  
**Sea Apache:** Proposed naval  
version.

### **Status**

In production.

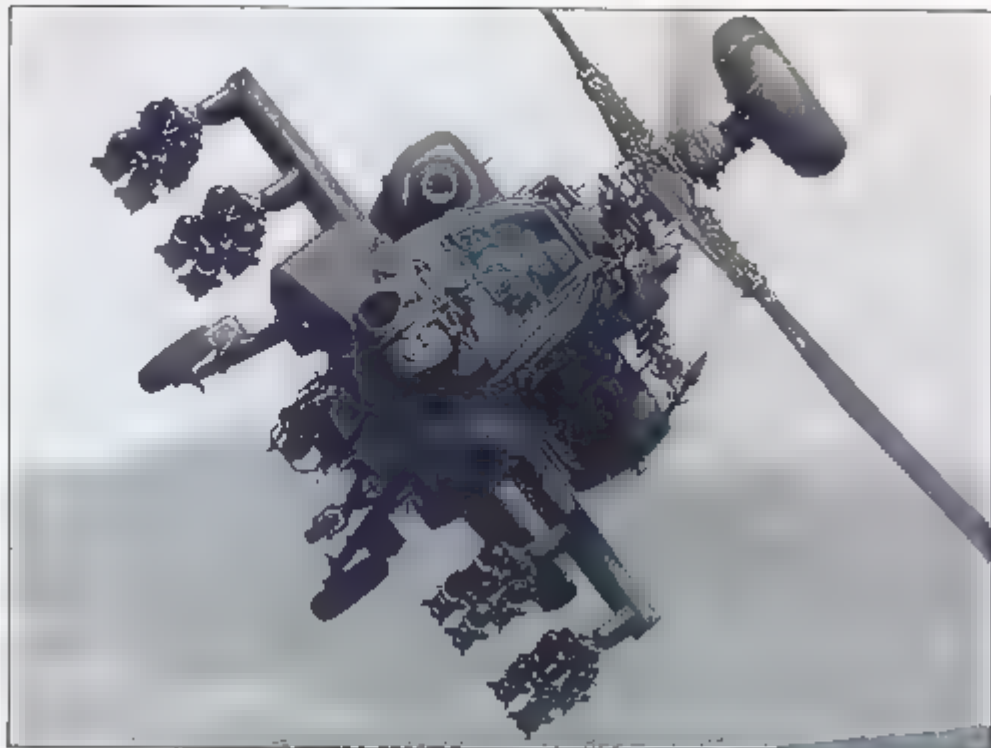
### **Operators**

Egypt (air force), Greece (army),  
Israel, Saudi Arabia (army),  
Netherlands (air force), USA  
(Mar Corps), UK (army), USA  
(army).

### **Manufacturers**

Hughes Helicopter  
Ind./Bell/Dunell/Dunlop  
Helicopter Company/Boeing  
Helicopters (USA), Westland  
Helicopter (UK).

**Boeing AH-64D**  
**Longbow Apache**  
(Boeing)



# Sikorsky S-58 Choctaw/Wessex (USA)

Type: Medium-lift helicopter

Accommodation: Two pilots, optional crew chief, 16 troops

## Development/History

The first version of the S-58 first flew in 1954, and the US armed forces operated large numbers until the OH-1 Huey entered service in the 1960s. The British-built version, the Wessex, also saw extensive service. Westland improved the Sikorsky single main-rotor design by installing single- and then twin-turboshafts. Users are now withdrawing them from service, although Uruguay has recently bought up surplus British machines.

## Variants (still in service)

Wessex HC 2: RAF utility and rescue version. Also operated by Uruguay.

Wessex HC 5: RAF transport and support helicopter.

Wessex HC 4: RAF Royal Flight MH version.

Wessex 50: Rescue version used by Uruguay.

CH-53: Transport version.

UH-340: Transport version.

S-100: Twin-turboshaft engine-powered version.

## Status

No longer in production.

## Operators

Argentina (air force), UK (air force), Uruguay (navy), Laos (army), Thailand (air force), Turkey (air force).

## Manufacturers

Sikorsky Aircraft (USA), Westland Helicopters (UK).



Westland Wessex HC Mk 2

(Tim Ringle)

## Specifications (for Wessex HC 2)

### Powerplant

Two Bristol Siddeley Gnome Mk 110/111

turboshafts

Power: 2700 shp (2014 kW)

### Dimensions

Length: 48 ft 4 in (14.7 m)

Length: 55 ft 10 in (17 m)

Rotor diameter: 62 ft (18.9 m)

Height: 16 ft 10 in (5.1 m)

### Weights

Empty: 1300 lb (590 kg)

Max lift: 1350 lb (612 kg)

Payload: 8000 lb (3632 kg)

### Performance

Max speed: 140 mph (226 km/h)

Range: 244 nm (396 km)

### Armament

7.62 mm door guns

# Sikorsky S-61/SH-3 Sea King (USA)

Type: Medium-lift/naval helicopter

Accommodation: Two pilots, (SH-3) two sensor operators, 26 troops

## Development/History

This Sikorsky design made its first flight in 1959, and the Westland company made several hundred for the United States Navy during the 1960s. The S-61 proved a very sound maritime helicopter, and NATO states ordered it in large numbers from American and local production lines.

Westland Helicopters in Britain began to develop its own variants from 1966, including anti-submarine, assault, maritime early warning and search and rescue. Production continued until the mid-1980s, with more than 300 being built for domestic and export markets.

## Variants

YXSS-2: Prototype version

HS-7/SH-3A: Original US Navy production version for anti-submarine warfare (ASW), powered by T-58-GE-8B

Helicopters rated at 1337.5 kW (1820 shp), fitted with dipping sonar and capable of carrying torpedoes or nuclear depth charges.

SH-3AD: Utility version without ASW equipment for US Navy and USMC

SH-3A: US Navy coastal search and rescue version, featuring extra fuel tanks and Minegus armament

SH-3A: Experimental versions with turboprops and wings

SH-3A: US Navy mine-sweeping version

V-3A: US Marine Corps version for Presidential transport.

SH-3D: Improved US Navy ASW version with T58-GE-10 engines and improved mission systems. Licence-built in UK, Italy and Japan

VH-3D: US Marine Corps version for Presidential transport



Sikorsky S-30

(US Navy)

## Specifications (for SH-3H Sea King)

### Powerplant

Two General Electric T40-C6 ■ turboprops

Power: 2000 shp (2028 kW)

Payload: 6000 lb (3000 kg)

### Performance

Max speed: 166 mph (272 km/h)

Range: 542 nm (1005 km)

### Dimensions

Length: 25.11 m (82.7 ft)

Rotor diameter: 62 ft (18.9 m)

Height: 15.11 m (49.2 ft)

### Armament

Mk 44, 46, 50, A244/S, 56-kg Ray torpedoes, Mk 11 depth charges; Mk 37 and 48 nuclear depth charges; Sea Eagle, AIM-9L missile, Meteor Mk 2 anti-ship missiles; GAU-7 7.62 mm M1913 miniguns; machine guns

### Weights

Empty: 11 865 lb (5382 kg)

Max TO: 20 500 lb (9300 kg)

## Sikorsky S-61/SH-3 Sea King (USA)

with T50-418-10 powerplant.

SH-3G: US Navy improvement of D-model with extra cargo and passenger carrying capacity.

SH-3H: US Navy improvement of D-model with improved mission systems for ASW work.

UH-3H: US Navy utility version without ASW mission equipment.

SH-3D-TS: ASW version.

SH-3H AW: Spanish Navy anti-submarine early warning version with Searchwater radar.

S-61A: Export version for Denmark to SH-3A standard.

AS-61A-4: Search and rescue export version for Malaysia, known as Niniis.

S-61D-3: Brazilian export version to SH-3D standard, later upgraded to SH-3D standard.

S-61D-4: Argentinean export version to SH-3D standard.

### Italian-built versions

AS11-3D: Navy version with T40-CE-100 engine rated to 1125 kW (1500 shp), ASW mission equipment and equipped for the Excal and Marte Mk 2 anti-ship missiles.

AS11-3H: ASW version with improved mission equipment.

AS-61-TS: VIP transport version, designated AS-61B/FX.

AS-61A-4: Export utility version with ASH-3D powerplant.

### Canadian-built versions

CH55-2/CH-124A: ASW version to SH-3D standard.

CH-124B/C: Upgraded version with improved mission systems.



Sikorsky SH-3G

(US Navy)



*Westland Sea King HC.Mk 4 'Jungle'*

*(Royal Marines)*



*Westland Sea King HC Mk 4 'Jungfrau'*

*(Tim Ripley)*

## Japanese-built versions

- S-61B: ASW version to SH-3A, later a S-61B-2 with improved mission systems was built to SH-3A standard.
- S-61A/AF: Utility, Antarctic survey and rescue version.

## British-built versions

- Sea King HAS 1: ASW version with Rolls Royce Gnome II1400 turboshafts rated to 1050 kW (1400 shp).
- Sea King HAS 2: Improved ASW version with updated Gnome II1400-1s.
- Sea King HAR 4: Assault and troop transport version.
- Sea King HAS 5: Improved ASW version with new radar and mission systems.
- Sea King HAS 6: Improved ASW version.
- Sea King HAR 3: Search and rescue version for RAF.
- Sea King HAR 3A: Improved search and rescue version for RAF.
- Sea King HAR 6: Royal Navy designation for its search and rescue version.
- Sea King Mk 4X: UK Ministry of Defence track version.
- Sea King Mk 41: Export version of Gnome for search and rescue.
- Sea King Mk 42: Export version for India to HAS 1 standard.
- Sea King Mk 42A: Export version for India to HAS 2 standard.
- Sea King Mk 42B: Export version for India with updated Gnome II1400-1T powerplants.
- Sea King Mk 42C: Export version for India to HAR 3 standard.
- Sea King Mk 43/40: Export version to Norway for search



**Westland Sea King HC.Mk 5 'Jungle'**

(Tim Hipley)

## Sikorsky S-61/SH-3 Sea King (USA)

and rescue.

Sea King Mk 45/A: Export version to Pakistan to HAS 3 standard.

Sea King Mk 47: Export ASW version for Egypt to HAS 2 standard.

Sea King Mk 48: Export rescue version for Belgium to HAS 3 standard.

Sea King Mk 50/A: Export version for Australia to HAS 2 standard.

Sea King AEW 2A: Airborne early warning version with searchwater radar.

Sea King AEW 2: Improved airborne early warning version with upgraded searchwater radar.

Commander Mk 1 (Sea King Mk 70): Assault and troop transport version for Egypt.

Commander Mk 2 (Sea King Mk 72): Assault and troop transport version for Egypt.

Commander Mk 2A (Sea King Mk 82): Assault and troop transport version for Qatar.

Commander Mk 2C (Sea King Mk 92): VIP version for Qatar.

Commander Mk 21 (Sea King Mk 73): Electronic warfare version for Egypt.

Commander Mk 3 (Sea King Mk 74): Naval version for Qatar, fitted to fire Exocet missiles.

### Status

No longer in production.

### Operators

Argentina (navy), Australia (navy), Belgium, Brazil (navy),



Sea King HC Mk 4 'Jungle' over Bosnia

(LA (Phot) Terry Morgan)



Canada (air force), Denmark (navy), Egypt, Germany (navy), India (navy), Iraq, Iran, Italy (navy/air force), Japan (navy), Malaysia (air force), Norway, Pakistan (navy), Peru (navy), Qatar, Saudi Arabia (air force), Spain (navy), Thailand (navy), Venezuela (army), UK (navy/air force), USA (navy).

### Manufacturer

Sikorsky Aircraft (USA), Agusta (Italy), Westland Helicopters (UK), Mitsubishi Heavy Industries (Japan), United Aircraft (Canada).

**Westland Sea King HC.Mk 4 'Jungle'** in service with the Royal Navy

(Mottin Production Cell/LAND)



# Sikorsky S-61N-1 Silver (USA)

Type: Passenger transport helicopter

Accommodation: Two pilots, 30 passengers

## Development/History

A development of the Sea King largely for the civil market, this version has been employed by a number of military users for troop transport and rescue work. Civil operators have also chartered them for military customers in the Middle East and the Falklands.

## Varlants

S-61N: Civil version

S-61NR: Export search and rescue version for Argentina

AS-61A-1: Russian-made export version for Malaysia

## Status

No longer in production

## Operators

Argentinian Naval, Malaysian Air Force,  (UN), United Nations

## Manufacturer

Sikorsky Aircraft (USA), Agusta (Italy)



*Sikorsky S-61N-1 Silver*

## Specifications (for S-61N)

### Powerplant

Two General Electric CT58-140-1 turbo shafts

Power: 2000 shp (2236 kW)

### Dimensions


Length: 72 ft 10 in (22.2 m)

Rotor diameter: 62 ft (18.9 m)

Height: 17 ft (5.2 m)

### Weights

Empty: 12 500 lb (5674 kg)

Max T/O:  000 lb (5980 kg)

Payload: 7000 lb (3176 kg)

### Performance

Max speed: 146 mph (235 km/h)

Range: 400 nmi (791 km)

# Sikorsky S-61/HH-3 (USA)

Type: Medium-lift transport helicopter

Accommodation: Two pilots, 30 troops, 15 stretchers

## Development/History

Known as the Jolly Green Giant during the Vietnam War, the HH-3E revolutionised combat search and rescue work by being the first in-service helicopter to employ in-flight refuelling. Eventually superseded by the larger S-65 series in USAF service, the HH-3E found a niche in maritime rescue work with the US Coast Guard and Italian Air Force.

## Variants

CH-3E: USAF utility and hoist recovery version.

AS-61R Pelican: Italian-built search and rescue version.

HH-3E Jolly Green Giant: USAF combat search and rescue version with in-flight refuelling.

MH-3E: USAF special forces version with in-flight refuelling.

HH-3F Pelican: US Coast Guard search and rescue version.

VH-3E: USAF VIP transport version.

## Status

No longer in production.

## Operators

Britain (air force), US (coast guard)

## Manufacturer

Sikorsky Aircraft (USA), Agusta (Italy).



US Army HH-3E

(AP)

## Specifications (CH-3E)

### Powerplant

Two General Electric T58-A1-5 turboprops

Power: 1700 shp (1223 kW)

### Dimensions

Length: 57 ft 3 in (17.4 m)

Rotor diameter: 42 ft (12.7 m)

Height: 17 ft 1 in (5.1 m)

### Weights

Empty: 13 225 lb (6000 kg)

Max T/O: 22 650 lb (10 300 kg)

Payload: 5000 lb (2270 kg)

### Performance

Max speed: 162 mph (261 km/h)

Range: 404 nm (748 km)

### Armament

Base machine guns

# Sikorsky S-65A/CH-53 Sea Stallion (USA)

Type: Heavy-lift transport helicopter

Accommodation: Two pilots, crew chief, 37 troops, 24 stretchers

## Development/History

Sikorsky's big lifter first flew in 1964, and was quickly adopted by the US Marine Corps as its heavy assault transport. Some 124 D-models were bought by the Marine Corps, and have remained in service through to the 1990s. The USAF adopted the aircraft as its principal long-range special operations and combat search and rescue helicopter, instigating several upgrades to maintain its deep penetration capabilities.

## Variants

CH-53A: Original USMC version powered by General Electric T64-G4-16 turbo shafts.

HH-53A: USAF training version similar in capability to CH-53A.

HH-53B/C: USAF combat search and rescue version with in-flight refuelling probes.

CH-53C: USAF rescue version with out in-flight refuelling probe.

CH-53D: Improved USMC version with updated T64-GE-413 engines, each rated at 2127 kW (2875 shp).

HH-53H: US Navy minesweeper, powered by two T64-GE-413s each rated at 1200 kW (1610 shp).

HH-53J: Pawe Low III: USAF special operations version. Fitted with in-flight refuelling, night vision equipment and terrain following radar and powered by two T64-GE-7A each rated to 2935 kW (3950 shp).

S-65C-270: Austrian export versions built to CH-53C standard, later sold to Israel.

S-65C-3: Israeli export version similar to USAF HH-53Cs.



*Sikorsky/VFW-Fokker CH-53D Sea Stallion serving with the United Nations Special Commission in Iraq after the Gulf War*  
(Tim Rippl)

## Specifications (for CH-53A)

### Powerplant

Two General Electric T64-G4-16 turbo shafts

Power: 5124 shp (3760 kW)

### Weights

Empty: n/a

Normal 1/G: 35 400 lb (15 676 kg)

Payload: External 13 000 lb (5897 kg)

### Dimensions

Length: 67 ft 2 in (20.47 m)

Rotor diameter: 72 ft 2 in (22.02 m)

Height: 24 ft 11 in (7.6 m)

### Performance

Max speed: 135 mph (214 km/h)

Range: 257 nm (473 km) with auxiliary tanks

### Armament

2.02 mm or 12.7 mm door guns



**Sikorsky CH-53D Sea Stallion**

*(Tim Ripley)*

## **Sikorsky S-65A/CH-53 Sea Stallion** (USA)

---

CH-53 2000: Israeli upgrade also known as Yav'ar 2000, designed to extend life into the next century. Turkey is interested in buying this version.

CH-630: German-built version.

### **Status**

No longer in production.

### **Operators**

Germany (many), Iran, Israel, USA (all three formerly/military).

### **Manufacturer**

Sikorsky Aircraft (USA), WSW-Fokker (Germany).



**Sikorsky MH-63J  
Pave Low  
(USAF/DoD)**

# Sikorsky S-80/CH-53E Super Stallion (USA)

Type: Heavy-lift transport helicopter

Accommodation: Two pilots, crew chief, 55 troops

## Development/History

The S-80 series Super Stallion utilizes three engines to make it one of the most powerful heavy-lift helicopters in the world. The US Marine Corps and Navy began taking delivery in 1981, and some 177 were built until production ceased in 1996.

Major variants used by the US Navy and Japanese Maritime Self-Defence Force are operated from amphibious warlike ships or shore bases.

## Variants:

CH-53E Sea Stallion: US Navy and Marine Corps Assault and heavy-lift version

HH-53E Sea Dragon: US Navy mine-sweeping version

S-80B1: Permanent export version of CH-53E

S-100M-1: Japanese mine-sweeping version

## Status

Not longer in production.

## Operator

USA (navy/marines), Japan (navy).

## Manufacturer

Sikorsky Aircraft (USA)



*Sikorsky CH-53E Sea Stallion*

(Tim Ripley)

## Specifications (for CH-53E)

### Powerplant

Three General Electric T64-GC-416 turboshafts

Power: 36 1400 hp (9738 kW)

### Dimensions

Length: 73 ft 4 in (22.3 m)

Rotor diameter: 79 ft (24.1 m)

Height: 29 ft 5 in (8.9 m)

### Weights

Empty: 33 720 lb (15 172 kg)

Max T/O: 49 250 lb (22 640 kg)

Payload: 11 000 lb (5000 kg) or 36 000 lb (16 330 kg)

### Performance

Max speed: 196 mph (315 km/h)

Ferry Range: 1170 nm (2074 km)

### Armament

1.62 mm or 12.7 mm disc guns

**Sikorsky S-80/CH-53E Super Stallion (USA)**



**Sikorsky CH-53E Sea Stallion**

(Tim Ripley)





**Sikorsky MH-53E Sea Dragon**  
(United Technologies/Sikorsky Aircraft)



**Sikorsky MH-53E Sea Stallion**  
(United Technologies/Sikorsky Aircraft)

# Sikorsky S-70/UH-60 Blackhawk (USA)

Type: Medium-lift utility helicopter

Accommodation: Two pilots, crew chief, 14 troops

## Development/History

In the early 1970s the US Army began looking for a UH-1 Huey replacement which would take into account many of the lessons learnt from combat helicopter operations in Vietnam. Improved crash worthiness was a major criterion in the design, which first flew in 1974.

The first production version flew in 1978, and soon the UH-60A was in widespread service with the US Army, seeing combat in Helmand in 1983. An improved version capable of lifting a HUMVEE or a 155 mm howitzer under-slung was developed in the early 1990s, eventually being designated the UH-60L. In total the US Army has bought some 1400 separate original plans for 2262, with other variants being ordered for the US Army and export.

## Variants

UH-60A: Original US Army utility version.

UH-60A SHTAS: Proposed ground support hover under version.

UH-60L: US Army version with uprated T801-GE-700C engines.

UH-60L: South Korean version for L-series standard.

UH-60G: Darklight: Proposed Medical evacuation version, with external hoist.

EH-60A Quick Fix: Electronic warfare version.

EH-60C Quick Fix: Improved electronic warfare version.

MH-60A Vulture Hawk: US Army special forces version.

MH-60G: Vulture Hawk USAF special forces version with on-flight refuelling.

HH-60G: USAF search and rescue version.

MH-60K: US Army special forces version with on-flight



*Sikorsky UH-60L Blackhawk*

*(Tim Hipley)*

## Specifications (for UH-60A)

### Powerplant

Two General Electric T801-GE-700 turbo-shafts

Power: 2244 shp (2420 kW)

### Dimensions

Length: 50 ft (15.3 m)

Rotor diameter: 53 ft 8 in (16.4 m)

Height: 19 ft 10 in (5.9 m)

### Weights

Empty: 11 284 lb (5118 kg)

Max ftw: 20 250 lb (9185 kg)

Payload: 6000 lb (2620 kg) under-slung

### Performance

Max speed: 114 mph (230 km/h)

Range: 319 nm (592 km); 1200 nm (2222 km)

with spec'd payload

### Armament

2.62 mm or 12.7 mm door guns and pods; free-fall rocket pods, AIM-114 Hellfire and guided anti-tank missiles



*Sikorsky S-70 Armed Blackhawk*

*(United Technologies/Sikorsky Aircraft)*



**Sikorsky HH-60G Pave Hawk**

*(United Technologies/Sikorsky Aircraft)*

refuelling probe.

MH-60L: US Army special forces version with in-flight

refuelling probe and powered T700-GE-700C engines.

VH-60DN: US Presidential transport version.

S-70A-1: Small land forces version.

S-70A-11: Small VIP transport/medevac version.

S-70A-5: Philippines export version.

S-70A-9: Australian-assembled version.

S-70A-11: Jordanian export version.

S-70A-12: Japanese search and rescue version, designated UH-60J.

S-70A-14: Brunei export version.

S-70A-14i: Test bed for Bell-Boeing/TurboMech BME 112.

S-70A-17: Turkish export version.

S-70A-18: Westland-produced version, designated WS-70.

S-70A-21: Iraqi export version.

S-70A-24: Mexican export version.

S-70A-26: Moroccan export version.

S-70A-27: Hong Kong export version.

S-70C: Chinese export version.

S-70C-2: Brunei version with hook used by fire-wire team Brunei.

## Status

In production

## Operators

Australia (army), Bahrain, Brazil (army), Brunei, China, Colombia (army/air force), Egypt, Israel, Greece (army), Hong Kong, Japan (army/air force), Jordan, Malaysia, Mexico,



**Sikorsky UH-60L Blackhawk**

(United Technologies/Sikorsky Aircraft)

## **Sikorsky S-70/UH-60 Blackhawk (USA)**

Malawi (air force),  
Saudi Arabia (army), South  
Korea (army), Taiwan (air force),  
Turkey (army), Thailand (army),  
USA (army/navy/air force)

### **Manufacturer**

Sikorsky Aircraft (USA),  
Mitsubishi Heavy Industries  
(Japan), Westland Helicopters  
(UK), Hawker de Havilland  
(Australia), Korean Air (South  
Korea)



**Sikorsky S-70A  
Blackhawk of Royal  
Brunei Armed Forces**  
(United Technologies/  
Sikorsky Aircraft)

# Sikorsky S-70B/SH-60 Seahawk (USA)

Type: Maritime helicopter

Accommodation: Two pilots, mission specialist

## Development/History

Navalised version of the S-70 series won the US Navy's LAMH competition with a development contract being issued in 1972. The SH-60B has 163 per cent commonality with the OH-60, but includes many features necessary for operations at sea, including anti-corrosion treatment for the airframe, improved engines and a HAH (hookway device) to secure the helicopter to a rolling ship deck in heavy seas. The US Navy has continued to develop the basic design, including a anti-submarine version with dunking sonar and a specialist combat search and rescue variant. Moves are now in hand to standardise the fleet under the SH-60A programme.

## Status

In production

## Variants

**SH-60B Seahawk:** Original US Navy light multi-purpose system (HAHPS) Mk III frigate and destroyer-borne helicopter, with AP5-124 radar, MAD and searchway homing systems.

**SH-60F Ocean Hawk:** Carrier-borne (CV) inner sea zone anti-submarine helicopter, with Bendix dipping sonar and provisions for three Mk 50 torpedoes.

**S-70B-1(SI-mk1):** Japanese-built version of SH-60B.

**SH-60R:** US Navy programme to standardise B, F and H versions.

**S-70B-2 RAWS:** Australian version with domestically-produced radar, searchway and other systems. Also provision for Sea Skua and Penguin radar-guided anti-ship missiles.



*Sikorsky S-70B-B Seahawk of Greek Navy*

*(United Technologies/Sikorsky Aircraft)*

## Specifications (for SH-60B)

### Powerplant

Two General Electric T400-GE-401C turboshafts  
Power: 1800 shp (1321 kW)

Max T/O: 21 184 lb (10928 kg)  
Payload: n/a

### Dimensions

Length: 50 ft 0.75 in (15.26 m)  
Rotor diameter: 31 ft 8 in (9.66 m)  
Height: 17 ft (5.18 m)

### Performance

Max speed: 145 mph (234 km/h)  
Range: 320 nm (592 km) for 3-hour loiter

### Weights

Empty: 13 640 lb (6191 kg)

### Armament

2x27 mm and 12.7 mm dual guns, AGM-119B Penguin anti-ship missiles; Mk 46 or Mk 50 torpedoes; free-fight rockets.



**S-70C(M)-1 Thunderhawk:** Taiwanese version of SH-60F. Local conversion to signals intelligence role has taken place.

**HH-60H Rescue Hawk:** US Navy specialised combat search and rescue version, with extra armament and night vision systems.

**HH-60J Jollyhawk:** US Coast Guard search and rescue version.

**S-70B-6:** Greek export version.

**S-70B-7:** Improved version with P66B-36B engines.

**CH-60:** Proposed US Navy utility version for support and vertical replenishment.

**Maplehawk:** Proposed Canadian rescue version.

### Operators

Australia (navy), Greece (navy), Japan (navy), Spain (navy), Taiwan (navy), USA (navy) and guard.

### Manufacturers

Sikorsky Aircraft (USA), Mitsubishi Heavy Industries (Japan), ASTA (Australia).

**Sikorsky SH-60B Seahawk**  
(United Technologies/  
Sikorsky Aircraft)





**Sikorsky SH-60B Seahawk**

*(United Technologies/Sikorsky Aircraft)*

# Sikorsky S-76 (USA)

Type: Medium-lift utility helicopter

Accommodation: Two pilots, 14 passengers

## Development/History

This private venture product has sold well to a number of civil and military customers around the world, but it has not found favour with the US armed forces.

## Variants

S-76: Original version powered by Allison 250-C30 turboshafts, rated to 485 kW (650 shp).

S-76 Mk II: Improved version.

S-76 Utility: Basic version.

AUH 76: Armed utility derivative, with provision for anti-aircraft, rockets and guns.

S-76A/C: Version with 539K59 (981 shp) Isomèra Ariel 151 powerplant.

S-76B: Production version with PT6B-36A powerplant.

H-76B: Military version of S-76B, with weapons provision.

H-76R: Naval version.

HE-26: Spanish designation.

## Status

In production.

## Operators

Chile [army], Guatemala, Honduras, Hong Kong, Iraq, Japan, Jordan, Philippines [air force], Spanish [air force], South Korea [army].

## Manufacturer

Sikorsky Aircraft (USA) and Daewoo (Korea).



*Sikorsky S-76C*

*(United Technologies/Sikorsky Aircraft)*

## Specifications (for H-76)

### Powerplant

Two Pratt & Whitney Canada PT6B-36A turboshafts

Power: 1982 shp (1464 kW)

Max T/O: 11 700 lb (5307 kg)

Payload: t/o

### Performance

Max speed: 178 mph (287 kph)

Range: 357 nm (661 km)

### Armament

7.62 mm, 12.7 mm or 20 mm machine gun pods; Stinger air-to-air missiles; Hellfire laser-guided missiles; TOW wire-guided anti-tank missiles; free-flight rockets

### Dimensions

Length: 48 ft (13.4 m)

Rotor diameter: 44 ft (13.4 m)

Height: 14 ft 5 in (4.4 m)

### Weights

Empty: 6641 lb (3012 kg)

# Glossary

**AEW** Airturme early warning

**ASV** Air-to-surface vessel

**ASW** Anti-surface vessel-warfare

**ASW** Anti-submarine warfare

**avionics** Aviation electronics, such as

communications radio, radars,

navigation systems and computers.

**beamless radar** Radar in which

shaping beam and pitch change

movements are provided by the

flexibility of the structural material

and not by bearings. No rotor is rigid.

**carbon fibre** Fine filament of

carbon-graphite used as strength

element in composites.

**CAS** Close air support.

**CBU** Cluster bomb unit.

**CFRP** Carbon fibre reinforced plastics.

**CH-IN** Counter-insurgency

combat Communications intelligence.

**composite material** Made of two

constituents, such as filaments or

short whiskers plus adhesive, forming

lending matrix.

**databus** Electronic highway for passing

digital data between already sensors

and system processors, usually MIL-

5711-1553B or ARINC 429 (one way)

and 429 (two way) systems.

**deducted** Engine restricted to power less

than potential maximum (usually such

engine is flat rated).

**DF** Direction finder or direction finding.

**fenestron** Helicopter tail rotor with

many slender blades rotating in sheet

disc.

**FJR** Forward-looking infra-red.

**Fly-by-Sight** Flight control system in

which signals pass between computers

and actuators using fibre optic leads.

**Fly-by-wire** Flight control system with

electrical signalling (i.e. without

mechanical interconnection between

cockpit flying controls and control

surfaces).

**g** Acceleration due to mass (with

gravity (i.e. of a body in free fall), or

acceleration due to rapid change of

direction of flight path.

**GPS** Global Positioning System.

**gunship** Helicopter designed for

battlefield attack, normally with one

heavily armoured pilot and weapon

operator only.

**hardpoint** Reinforced part of aircraft to

which external load can be attached,

e.g. weapon/lack pylons.

**HMD** Helmet-mounted display device.

**HMS** = sight.

**hot and high** Airspeed combination of

altitude height and high ambient

temperature, which lengthens required

take-off distance (TOD).

**hp** Horsepower.

**HDD** Head-up display.

**IFF** Identification friend or foe.

**IR** Infra-red.

**IRST** Infra-red search and track.

**J-SAWS** US Air Force/Naval Joint

Surveillance Target Attack Radar

System in Boeing E-8A.

**JIDS** Joint Technical Information

Dispensation System.

**Kevlar** Aramid fibre used as basis of

high-strength composite material.

**kph** Kilometres per hour.

**kN** Kilonewtons, the metric unit for

measuring power output of jet engine.

About 1.34 hp per hour.

**kW** Kilowatts, the metric unit for

measuring power output of a

propeller-driven engine.

**k** Pounds of static thrust, the

measurement of a jet engine's static

thrust.

**LTV** Low-light TV (thus LTV, low-

light-level).

**low penetrable materials** and

structures designed to reduce aircraft

signatures of all kinds.

**m** meter, the metric unit of length.

**MAD** Magnetic anomaly detection.

**MFD** Multi-function display.

**MMS** Main-mounted sight.

**MO** Maximum permitted operating

blade number.

**mph** Miles per hour.

**MAARO** Maximum take-off weight.

**nm** Nautical mile, (1.1512 miles) (1.2132

km).

**NOE** Nap-of-the-Earth (low-flying in

and/or aircraft using natural cover of

both and terrain etc).

**NVS** Night Vision Goggles.

**optics** Combination of optics and

electronics in viewing and sighting

systems.

**post** Left side, looking forward.

**pylon** Structure hanging aircraft to

external load (engine pylon, drop

tank, bomb etc).

**radius** The distance an aircraft can fly

from base and return without

intermediate landing.

**RAM** Radar absorbent material.

**radar rotor** see beamless radar.

**RPV** Remotely-piloted vehicle.

**SAR** i) Search and rescue.

ii) Synthetic aperture radar.

**shp** Shaft horsepower, measure of power

transmitted via rotating shaft.

**signal** Signals intelligence.

**signature** Characteristic "fingerprint" of

all electromagnetic radiation (radar, IR

etc).

**single-shaft** Gas turbine in which all

compressors and turbines are on

common shaft rotating together.

**SLAR** Side-looking airborne radar.

**stabiliser** i) (thus, horizontal stabiliser

= tailplane).

**starboard** Right side, looking forward.

**t** Tonne, 1 Megagram, 1000 kg.

**tilt-rotor** Aircraft with fixed wing and

rotors that tilt up for hovering and

forward for fast flight.

**T-4** Take-off.

**ton** Imperial (long) ton = 1.016 t or

2240 lb, US (short) ton = 0.9072 t or

2000 lb.

**turboshaft** Gas turbine in which as

much energy as possible is taken from

gas jet and used to drive helicopter

rotors.

**UAV** Unmanned air vehicle.

**winglet** Small auxiliary aerfoil, usually

sharply upturned and often

sweepback, at tip of wing.

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